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WEEKLY NEW YORK—THURSDAY, JUNE 22, 1905—CHICAGO 10 CENTS

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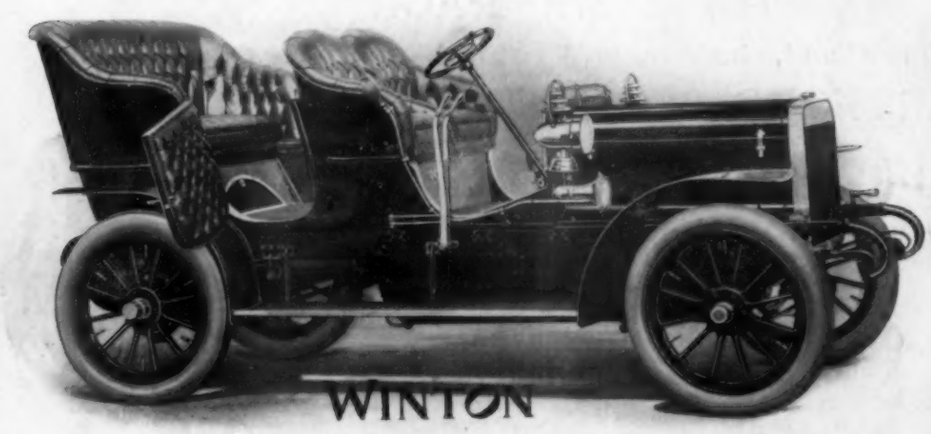

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THE AUTOMOBILE

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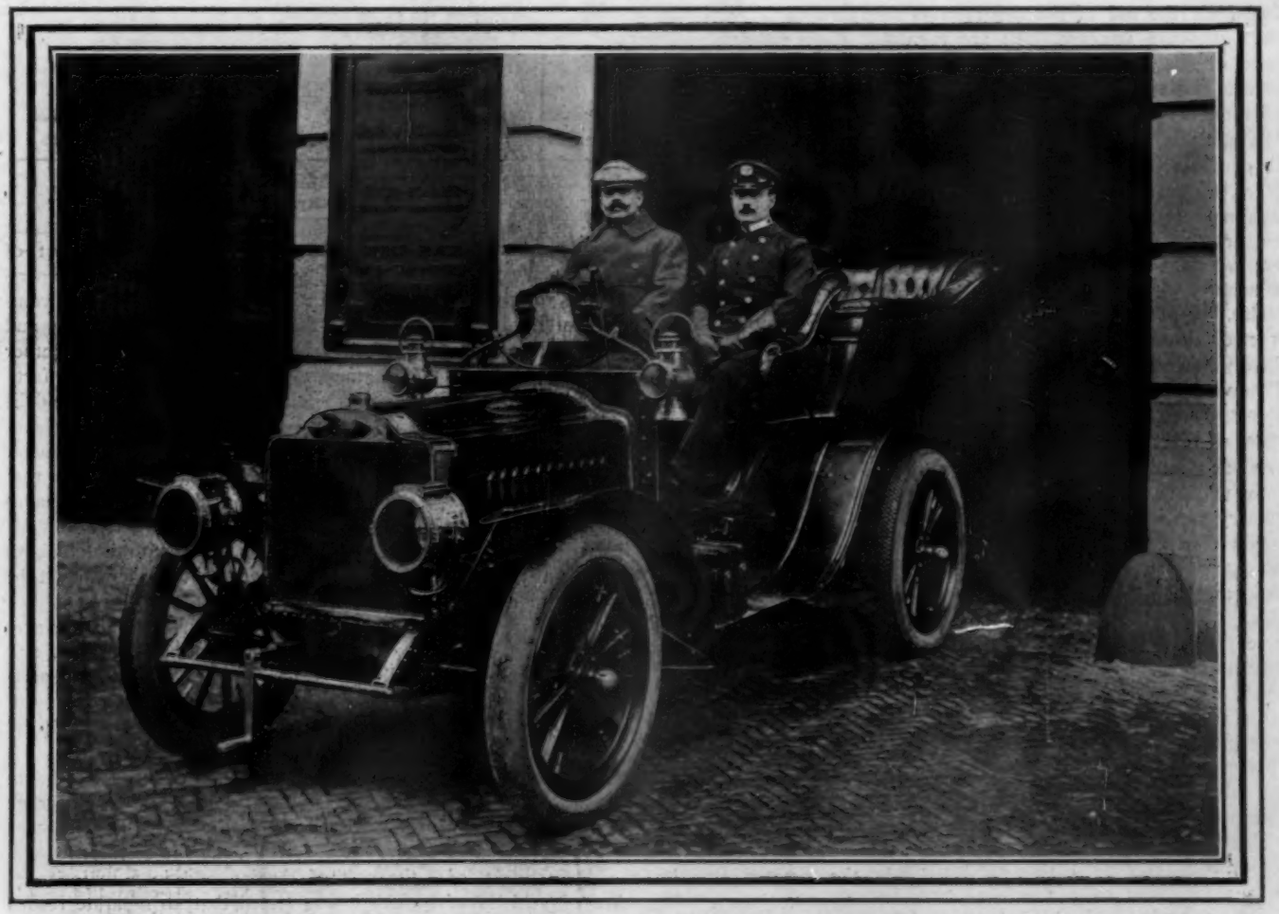
AUTOMOBILES USED BY NEW YORK CITY.

BY WILLIAM L. DUDLEY.

THE Government of the City of New York, as the proprietor of the largest business in the United States, with the exception of the National Government, employing an army of over 50,000 men and 4,000,000 requiring water supply, sewer service and police and fire protection, presents almost unlimited opportunities for the employment of motor vehicles of almost every form, and in consequence the official attitude of the city government toward the automobile and the progress made in its adoption are subjects of great moment to the automobile industry in general.

In the beginning of the general use of automobiles, the attitude of the New York City officials was, as a rule, one of pronounced hostility, as was shown by the excessively restrictive legislation attempted by the Board of Aldermen before the passage of a state automobile law, and in other respects. This feeling may still exist in some quarters, but in general it has disappeared, and, during the past year or two, motor vehicles have been adopted to a large



FIRE CHIEF EDWARD F. CROKER AT THE WHEEL OF HIS COLUMBIA CAR, AND CAPTAIN RUSH OF ENGINE COMPANY 33 LEAVING DOWN TOWN FIRE HEADQUARTERS IN GREAT JONES STREET, NEW YORK CITY.
Photograph Copyright by Lewis Gruber.

5,000 horses, and exercising jurisdiction over an area of over 326 square miles containing 1,200 miles of paved streets to be swept and lighted, over 6,000 acres of parks to be maintained, and a population of

extent in the regular work of a number of the city departments.

In order to learn just to what extent this movement has progressed, a careful canvass of the city departments has been made by THE AUTOMOBILE, which reveals the surprising fact that the city government is not only the largest owner of automobiles in greater New York outside of the public transportation companies, but that plans are now pending to more than double the number now in use at an early date. As far as the city government is concerned, therefore, it is evident that the automobile has won a decisive victory over the opposition with which it was greeted some years ago, and wherever available for the work of the city its use is now only a matter of time.

In all, twenty-one automobiles are now in use by the city officials, this total including two private cars owned by Mayor McClellan and Borough President Joseph Cassidy, of Queens, respectively, which, however, are used for official purposes when occasion demands. The remaining nineteen vehicles are the property of the city and were purchased for the use of the departments to which they are attached. All are regular stock models of some well-known make. Sixteen employ gasoline for motive power and three are steamers.

In addition, plans have been made for the purchase of thirty-four additional machines, for several of which the appropriations have already been made. All of these new vehicles will be of the gasoline type, and, with the exception of twenty motor ambulances planned for the Department of Health, one of which has already been constructed, all will be regular stock models. The division among the various departments of the vehicles in active use as well as those in prospect will be shown by a table in the course of this article.

As has already been noted, the twenty-one motor vehicles in actual use are all of the ordinary pleasure pattern, and without exception they are used for general inspection purposes over wide areas where the employment of horses would be impracticable. The field of the 5,000 or more work horses employed by the city has been invaded, and when one considers the wide variety of special motor vehicles, such as motor trucks, ambulances, patrol wagons, fire engines, street cleaning and street sprinkling cars, lawn and road rollers, and the like, which have been devised and are in actual use by various municipalities at home or abroad, it must be admitted that despite the comparatively good showing made by the accompanying table, the local municipality is nevertheless far behind many other American and foreign cities in the adoption of motor vehicles for special uses.

To briefly summarize the magnitude of the special fields now occupied by the horse-drawn vehicles in the city service, it may be noted that the Street Cleaning Department operates 1,439 horse-drawn carts

OUTLINE MAP OF NEW YORK CITY AND ADJACENT TERRITORY.
Shaded Portions Show N. Y. City.

regularly upon the streets in the boroughs of Manhattan and the Bronx, and employs from 6,000 to 7,000 additional vehicles for snow removal during the winter. It also uses sixty-three driving horses for inspection purposes, besides the six automobiles which figure in the table. In all, about 2,000 horses are employed in this department in Manhattan, the Bronx and Brooklyn alone. The street cleaning in the boroughs of Queens and Richmond is under the control of the presidents of those two boroughs.

The Fire Department affords a wide field for the employment of motor fire engines, hose carts and trucks, there being seventy-five fire companies in the Borough of Manhattan and the Bronx and sixty-three in Brooklyn. Including Queens and Richmond boroughs, there are probably 1,200 horses used in this service. There are seventy-two police stations in Manhattan, the Bronx and Brooklyn, to each of which a patrol wagon is attached. There are sixteen horse-drawn ambulances in use in the five boroughs of the greater city by the Department of Health. The total number of vehicles of all sorts in the city service is probably over 2,000 and the number of horses upward of 5,000.

An interesting aspect of the inquiry was the attitude of the officials who were approached for information upon the subject. In the largest and busiest departments, including the Street Cleaning Department, the Fire Department and the Department of Health, the utmost courtesy was experienced and all the information at the command of the officials was cheerfully and promptly supplied. In some of the other departments, however, the desired facts were only obtained with the utmost difficulty, despite the carefully worded explanation of their intended use, and it was evident that there was more than a suspicion that some newspaper attack, alleging extravagance upon the part of the city officials in supplying themselves with automobiles at the expense of the taxpayers, must be contemplated.

In only one bureau was the old time prejudice against motor vehicles shown, and and that was in one of the smaller departments, where an inquiry whether any automobiles are in use there was met with the reply: "No, and we don't want any."

The utmost difficulty was experienced in obtaining any data regarding the average or total mileage of the cars, the amount of gasoline consumed, the life of the tires and the cost of repairs, and in a majority of cases it was stated that no separate record of these items is kept. Of course, records of expense of maintenance could be obtained by picking the items out of the general supply accounts, but it is evident that they would have little or no value in view of the fact that no records of mileage were kept. Moreover, the fact that these vehicles without exception (as already stated) are

employed in a service which would be impossible for horses to perform, not only would make it impossible to make a comparison between the work of these automobiles and any horse-drawn vehicles in a similar capacity (other than the general statements made by the heads of several of the departments that the automobiles are ten times as efficient as horse-drawn vehicles would be) but explains to a large extent the reason why no such records are kept.

Another factor which tends to make the expense of maintenance a negligible quantity is the fact that in every case the departmental automobiles are stored upon city property, so that the garage expense which private owners in the city are obliged to bear is entirely eliminated.

The difficulty of obtaining good chauffeurs, and even more of keeping them when once obtained, was the principal complaint made. Chauffeurs are required to pass a civil service examination, and are paid from $3 to $4 a day, though some receive $100 a month. The complaint was made that the examination is too theoretical and not sufficiently practical, with the result that inexperienced men are appointed, who, as soon as they become experienced, leave to take places with private owners, where work is easier and not so monotonous.

Tire troubles are treated lightly in Manhattan, but are considered serious in Brooklyn and Queens, a difference easily accounted for by the rough going experienced in some of the outlying districts of the latter borough.

In the following the use of the motor vehicle is considered separately for each department of the city, in the order of their present importance from an automobile point of view:

DEPARTMENT OF STREET CLEANING.

This department has jurisdiction over the boroughs of Manhattan, the Bronx and Brooklyn only, the street cleaning in the boroughs of Queens and Richmond being under the direction of the presidents of those boroughs. There are 600 miles of paved streets in the boroughs of Manhattan and the Bronx and 444 miles in Brooklyn, making a total of 1,044 miles in the three boroughs combined. The cleaning of these streets requires a force of 1,439 carts and considerably more than that number of horses, in addition to which from 6,000 to 7,000 additional vehicles are required during the winter for snow removal. The entire mileage of more than 1,000 miles is inspected daily by the district inspectors, who employ some sixty-three driving horses for the purpose, and in addition, by Major J. M. Woodbury, chief of the department and the inspectors on his staff, who use six automobiles in the service and are about to acquire a seventh. It is the unanimous testimony of the officials of this department that "horses could not begin to do the work required of the automobiles" in this connection, or, as Commissioner Woodbury tersely puts it, "The automobiles multiply by ten the radius of effective inspection."

It was impossible to obtain any detailed figures as to the total mileage or the cost of maintenence of the automobiles used in this department, but it was stated that the daily mileage of each machine was between thirty and seventy-five miles, and that a monthly average would be at least 1,500 miles, with a consumption of gasoline of about one gallon to every ten miles.

Commissioner Woodbury uses a 10-horsepower Panhard bought in May, 1904; this machine, though driven night and day at times, and in constant use since its date of purchase, has never been laid up and has not incurred any expense for repairs. The cost of maintenance was said by Commissioner Woodbury to be simply the cost of the gasoline. The car has Samson tires, which have only recently been replaced after a year of service.

Captain Gibson, the deputy commissioner of Street Cleaning, has a 12-horsepower Panhard touring car, with Phœnix motor, which was formerly owned by Charles W. Morse and was bought about three months ago. It has been in constant use since its purchase with highly satisfactory results. It also is fitted with Samson tires.

Captain Gibson used a Searchmont touring car from July, 1904, to February, 1905, which gave excellent results with practically no expense for repairs. However, it was found to have insufficient engine power, and a four-cylinder 24-horsepower motor is now being installed in it by the Fairmount Engine Co., of Philadelphia, after which it will be sent to Brooklyn, where it will be used by District Superintendent Clarke, in charge of the Borough of Brooklyn.

General Inspector T. Harry Shanton, of the Street Cleaning Department, uses a 16-horsepower Premier, with air-cooled motor, fitted with G and J tires, which was bought in June of last year. During the series of continuous snowfalls which lasted for six weeks last winter, this machine was used almost constantly day and night, and was given very rough usage, but stood up through it all without a single breakdown and with very little cost for minor repairs. In more than a year of hard service the tires were punctured only five times and two of the original shoes still remain in use, the other two having been replaced recently. Before the Premier was bought, Capt. Shanton rented a Rambler, which did excellent service during the winter of 1903-4.

The oldest machine in use in the department is a Stevens-Duryea runabout of 7-horsepower, with buggy top, which was bought early in 1904 and was used by District Superintendent M. D. Bouton, in charge of the Borough of the Bronx, whose district extended from the Harlem river to City Island. It has done excellent service and is still in use, being now used by Assistant General Superintendent D. J. C. Wallace. A similar vehicle is in use in the Borough of Richmond.

The latest addition to the garage of the Street Cleaning Department is a 24-horsepower Fiat, which was bought second-hand three months ago and has only recently gone into service. It is being used by Major Woodbury while his Panhard is being overhauled, after which it will probably be sent to Brooklyn.

The department maintains a repair shop in "Stable A," Seventeenth street and Avenue C, for the repair of its horse-drawn vehicles, where a skilled mechanic is constantly employed, and the automobiles also have the use of this shop for slight repairs. They

DEPARTMENT OF STREET CLEANING PANHARD CAR AND PROMINENT CITY OFFICIALS.

Commissioner of Street Cleaning Major J. M. Woodbury in far seat of tonneau, Mayor George B. McClellan in near seat, and standing beside him, Deputy Commissioner F. M. Gibson.

are kept at the street cleaning department stable nearest to the residences of the officials who use them. Chauffeurs are paid $100 a month in this department, but are difficult to keep at this price, as they are constantly leaving to obtain higher wages from private employers.

All the officials of this department speak in the highest terms of the performances of these inspection cars, and Commissioner Woodbury's statement that ten times as much could be done by one man with an automobile as with a horse-drawn vehicle, was confirmed by other officials of the department. The advantages in general were thus summed up by Mr. Shanton:

"The automobile is not only a great help to a city department, but in ours, at least, is now an absolute necessity, as all our work is now based upon our ability to use automobiles. Without them we could not do one-tenth the work of inspection with our present staff. It is the result of my experience, however, that runabouts are unsuited to the heavy demand made upon them by our work, and that only large and strongly built machines, with four-cylinder, water-cooled engines and sliding gear transmission should be employed. The running gear should be particularly heavy, with big, strong axles, knuckles and wheels. It pays to get big, powerful cars at the start, even if they are higher priced, because they are the cheapest in the end on account of costing less in repairs than the cheaper, low-powered machines. That is the policy of the department, and we prefer to buy a big, strong car second-hand rather than a new cheap small machine when we are forced to keep within a certain fixed price."

FIRE DEPARTMENT.

Only two automobiles are now in use in this department, a 35-40-horsepower Columbia used by Chief E. F. Croker in the Borough of Manhattan and a 40-horsepower Locomobile used by Deputy Chief Thomas Lally in Brooklyn, but it is proposed to equip each of the five deputy chiefs in each of these two boroughs in a similar manner, which would make a total of eleven motor vehicles in the department as a whole. The deputy chiefs, with the exception of Deputy Chief Lally, now use horses and buggies.

Chief Croker formerly used a small steam runabout, which was his own property, but this did not give him satisfaction, so he abandoned it and went back to his horse and buggy until last September, when the big red touring car which he now uses was furnished him by the city. It has proven entirely satisfactory in service, and Chief Croker states that it would be impossible for him to obtain a similar amount of service with any number of horses. "There is no comparison," said he; "horses could not begin to do the work for a single day. The only trouble is that I am unable to keep a mechanic on account of the long and irregular hours which are required. I have had five in the last nine months. The longest any one of them stayed was two months, and he lost seventeen pounds in that time and decided to quit before he lost any more. I get them through the Civil Service Board, and they are paid $100 a month, but that is not money enough to hold them."

Chief Croker's automobile is kept in the house of Engine Company No. 33, on Great Jones street, so as to be close to the downtown district, where most of the big fires occur. He makes this house his headquarters at night, spending his time during the day at the headquarters of the department on East Sixty-seventh street. In case of a serious fire downtown during the day, the chief leaves headquarters in a buggy and meets the automobile on the way down.

An idea of the amount of service performed by Chief Croker with his automobile is obtained when it is known that from the battery to Forty-second street there are 189 fire alarms along Broadway to which he responds upon a first alarm between 8 P. M. and 7 A. M. In addition, he will go anywhere else in the city upon a second or third alarm, and upon a third or fourth alarm from Brooklyn he is almost certain to go over to that borough. He responds to about one alarm a day upon an average; frequently going out five and six times in a single day during the winter, when most of the city fires occur. In addition to these emergency calls, the chief makes regular visits of inspection to all the engine houses in the city, so that it is small wonder that he has difficulty in keeping a mechanic.

Chief Croker's car is usually driven by Captain Rush of Engine Company No. 33, who furnishes some interesting information regarding the maintenance of the machine. It might naturally be supposed that on account of the high speed at which the Fire Chief's vehicle is driven over all kinds of pavements and even sometimes over the curb and upon the sidewalk, that the wear upon the tires would be so excessive as to use them up very quickly, but Capt. Rush states that such is not the case. The front wheels are fitted with Goodrich clinchers and the rear wheels with Michelin Samson tires. The original equipment lasted from September, 1904, to May, 1905, despite the hard service during the unusually bad weather of last winter and no replacements were made until last month, when in a general overhauling of the entire machine the two rear shoes were replaced. The consumption of gasoline was said by Capt. Rush to average seven gallons for seventy-five miles.

Deputy Chief Lally's locomobile touring car, like Chief Croker's Columbia, is painted the regulation red of the Fire Department, and has a big bell mounted in front of the dash-board. It is used for longer trips than are undertaken by Chief Croker's vehicle, as Deputy Chief Lally's territory includes all of Brooklyn and Queens, and the roads in the outlying districts are often exceedingly poor. For this reason the experience with the tires has not been quite as satisfactory, several shoes having been replaced during the past ten months that the vehicle has been in use. The average mileage was stated to be ten miles to a gallon of gasoline. The car is kept at the Brooklyn Fire Department headquarters on Jay street, near Willoughby.

(To be continued.)

France Wins Rochet-Schneider Cup.

Special Correspondence.

PARIS, June 7.—By the victory of the 18-horsepower Peugeot, owned and driven by Mr, Perret, of the Ardennes Automobile Club, the Rochet-Schneider Cup has passed from Switzerland to France. Owing to its exacting nature and the quality of the competitors, the Rochet-Schneider Cup competition may justly be described as the Gordon Bennett of touring events.

This year's race was run over a mountainous and varied district, offering many grades and having the town of Zurich as its center. The total distance, exclusive of controls, of which there were about twenty on the circuit, was about 200 miles. Endurance and regularity, hill-climbing powers and average speed were the bases on which the sporting committee of the Swiss Automobile Club organized the competition. A total of 1,200 points could be gained, 300 being for regularity, 200 each for fuel consumption, hill-climbing, average speed, and price of the chassis, and 100 for water consumption.

In 1904 the Rochet-Schneider Cup was won for Switzerland by Marc de Martini with a 16-horsepower Martini. This Swiss firm acquired fame in 1903 by climbing the Rochers de Naye on the ballast of the rach railway with a grade of 23 per cent. for five miles of the distance, and last year accomplished in twelve days a run of 1,875 miles across the Alps, representing an ascension of 57,000 meters and including grades of 14 per cent. over mountainous passes never before traversed by an automobile.

The victory this year of the 18-horsepower Peugeot, which was pitted against thirteen cars of from 16 to 40-horsepower, representing France and Switzerland, brings the cup into this country and has aroused the enthusiasm of the French Section.

The A. A. A. racing board has reserved September 16 for a race meet to be held in Syracuse, under the auspices of the A. C. of Syracuse. As the date named is the last day of the New York State Fair, it will be necessary to arrange with the State Fair Commission for the holding of the meet, and a committee was recently appointed by the club for this purpose.

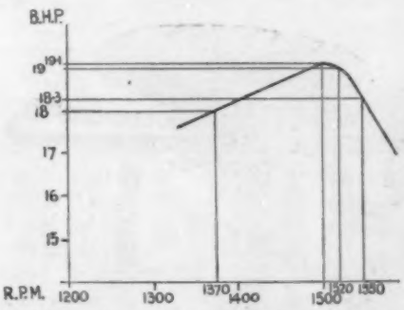
John D. Rockefeller has purchased a new automobile. The beauty of Mr. Rockefeller's position is that his gasoline will cost him nothing.—Nebraska City *News*.

Transmission Gearing Efficiency Test.

By RENE M. PETARD.

EXPERIMENTS were recently carried out at the laboratory of the Automobile Club of France in order to determine the efficiency of the transmission gearing of the modern automobile. The measuring apparatus used was Col. Renard's air resistance device, consisting of fan-shaped wheels mounted on the shaft transmitting the power to be measured. The air-resisting surface of the wheels is variable, and the amount of power absorbed per unit of surface at given speeds had previously been measured, and this afforded a very economical means of measuring power developed, no complicated or expensive apparatus being required, and no troublesome means of carrying away the transformed energy, either in the form of heat or of electricity being needed, the atmosphere doing all this.

The car upon which experiments were made was a Peugeot of 16 nominal horse-



CURVE OF PEUGEOT TRANSMISSION HIGH GEAR EFFICIENCY.

power, the engine having four cylinders whose bore and stroke were respectively eighty-five millimeters and ninety-five millimeters; normal speed, 1,500 revolutions a minute. The motor was first removed from the car and placed on the testing block and its power curve taken. The curve is shown herewith. The test gives the following figures:

Speed	Horsepower	Temperature
1,370 R. P. M.	18.0	+ 12 Centigrade.
1,500 "	19.1	"
1,520 "	18.9	"
1,550 "	18.3	"

The engine was afterwards placed on the car, the car jacked up and the fan wheels fitted on the rear wheels of the car. The engine was then run at an approximately constant speed of 1,500 revolutions a minute, corresponding to its highest power. The tests resulted as follows:

On second speed. Reduction through gearing, $\frac{105}{1000}$. Speed of road wheels, 160 revolutions a minute. Power delivered at wheel rims, 14.42 horsepower. Engine speed during test, 1,520 revolutions a minute. Engine power, 18.9 horsepower. Efficiency of gearing, 76 per cent.

On third speed. Reduction through gearing, $\frac{154}{1000}$. Speed of the wheels, 234 revolutions a minute. Power delivered at wheel rims, 15.04 horsepower. Engine speed during test, 1,500 revolutions a minute. Engine power during test, 19.1 horsepower. Efficiency, 79 per cent.

Top speed, direct drive. Reduction through bevel gearing, $\frac{334}{1000}$. Speed on the road wheels, 350 revolutions a minute. Power delivered at wheel rims, 16.89 horsepower. Engine speed during test, 1,495 revolutions a minute. Engine power during test, 19.04 horsepower. Efficiency, 89 per cent.

This at once shows the advantage, from this viewpoint, of the direct drive, amounting to a saving of as much as ten per cent. over a well designed gear drive.

The figures obtained in these trials are considered by French engineers as being those that would be obtained, with little variation, on testing any other French car of reliable manufacture, with direct drive on the high gear and at lower speeds through two sets of spurs, with double chain drive to the rear wheels. As the constructional details of the car actually tested might be of interest, some of them are described herewith.

Cylinders are cast in pairs, and the two outside cranks are set at an angle of 180 degrees to the two inside ones, this being both theoretically and practically the best arrangement for obtaining regularity of firing and reducing vibration. Valves are placed symmetrically on each side of the cylinder, all the valve operating gear being lubricated by splash from the crank case. A special type of make and break ignition is used, current being supplied by storage battery;

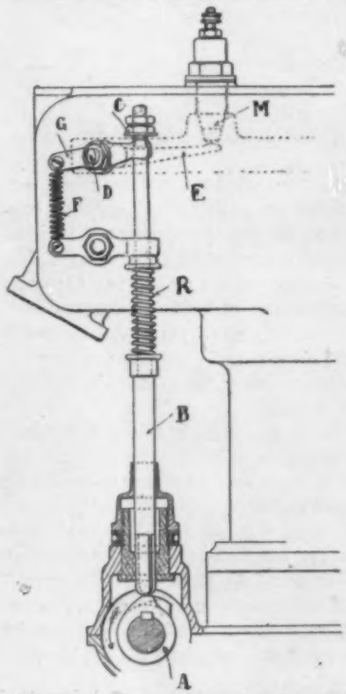
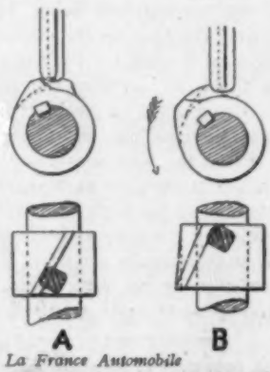


FIG. 1.—PEUGEOT CONTACT BREAKER

jump spark and coil ignition is fitted as an extra. As the Peugeot make and break ignition system is very highly thought of in France, a description of it will not be out of place.

The time of ignition is variable to suit the engine speed; but the magneto is rigidly



From La France Automobile

FIG. 2.—END AND TOP VIEWS OF SKEW CAM.

attached to the framing and positively driven from the motor, so that sparking does not necessarily take place at the point of highest voltage. The cam is specially designed to prevent sudden changes in the direction of movement of the push rod, so that the end of the rod never leaves the surface of the cam, and noise and undue wear is obviated. Fig. 1 shows very clearly the ignition mechanism. The spark plug *M* carries a single insulated contact point with which the arm *E*, within the cylinder, makes contact through ground. This striker arm is fixedly attached to a pivot pin passing through a gas-tight joint in the casting; a double armed lever *G* is also rigidly attached to the pivot, so that both striker and double armed lever move together. Spring *F* tends to hold the striker in contact with the sparking point of the plug; but the adjustable stop *C* keeps the contact points separated except when the stop rises, as shown in the illustration.

By this means contact is made just before ignition, and the comparatively wide face of the crest of the cam allows an interval for the flow of current to become sufficiently strong. When the cam allows the rod to drop, the stop *C* strikes the end of the double armed lever and drives it suddenly downward; the striker in the cylinder, being compelled to move with the double armed lever, breaks away from the plug point with a rapidity which is much augmented by the length of the arm. Spring *R* serves to keep the lower end of the push rod against the cam.

The time of ignition is varied by a peculiarly shaped cam. The cam is longer than usual and has a tooth which is placed like part of a screw thread of very steep pitch, as shown in Fig 2. The cam shaft moves longitudinally in its bearings, the time of ignition thus depending upon what portion of the cam is brought under the push-rod. In Fig. 2, *A* shows the cam set for very early ignition, while *B* shows the opposite

extreme, ignition occurring at the latest part of the stroke allowed by the adjustment.

The change speed gear is of the sliding gear type, having a single "train balladeur," with two gears in constant mesh; the shafts run in plain bearings. The differential is carried in the rear end of the transmission casing, the countershaft being bevel gear driven from the primary transmission shaft. Pressed steel is used for the main and sub frames, the latter carrying the motor and transmission casings; a steel pan extending from the front of the motor to the rear of the gear case. The tests bring to notice in a striking manner the great advantage of a direct drive on the high gear; for we find that, while the efficiency through the direct drive is nearly ninety per cent., it falls to about seventy-five per cent. when the indirect driving lower gears are used.

China presents great possibilities for the introduction of the small stationary gasoline engine, according to a report made by United States Consul George E. Anderson, of Hangchau, China. Strange though it may seem, one of the main reasons is that the Chinaman believes firmly that the erection of tall, smoking chimneys and high buildings interferes seriously with the operatons of the "wind spirit" and thereby brings bad luck. The Celestials will allow their business to be interfered with to any extent before they will take any chances of incurring the wrath of the spirit of the air; therefore, the gasoline motor, requiring no chimney, has a great advantage from their point of view. Labor in China is so cheap, however, that the motor must be low in price, and yet so substantial as to stand the abuse it is sure to get. American industry will have the strongest kind of competition from the Japanese, who are already making gasoline motors with the assistance of American and European experts, and the price of labor makes competition on the basis of cost alone almost out of the question.

Alcohol as a Fuel for Motors.*

Concluded from page 719 issue of June 15.

Deficient in Heat Units.

So far it has been seen that alcohol is deficient in heat units; that in efficiency and explosive range it is ahead of its competitors; that the combustion is more complete than with other fuels, and in consequence the alcohol motor will not be troubled by sooty plugs or odorous exhausts. It is true that French cars said to burn alcohol produce a strong odor, but, as already stated, that is because the alcohol is mixed with a considerable proportion of gasoline or benzine. The German Government cars use a mixture of alcohol with ten per cent. of water and about two and a half per cent. of benzol, and it is impossible to detect any odor within three yards of the exhaust.

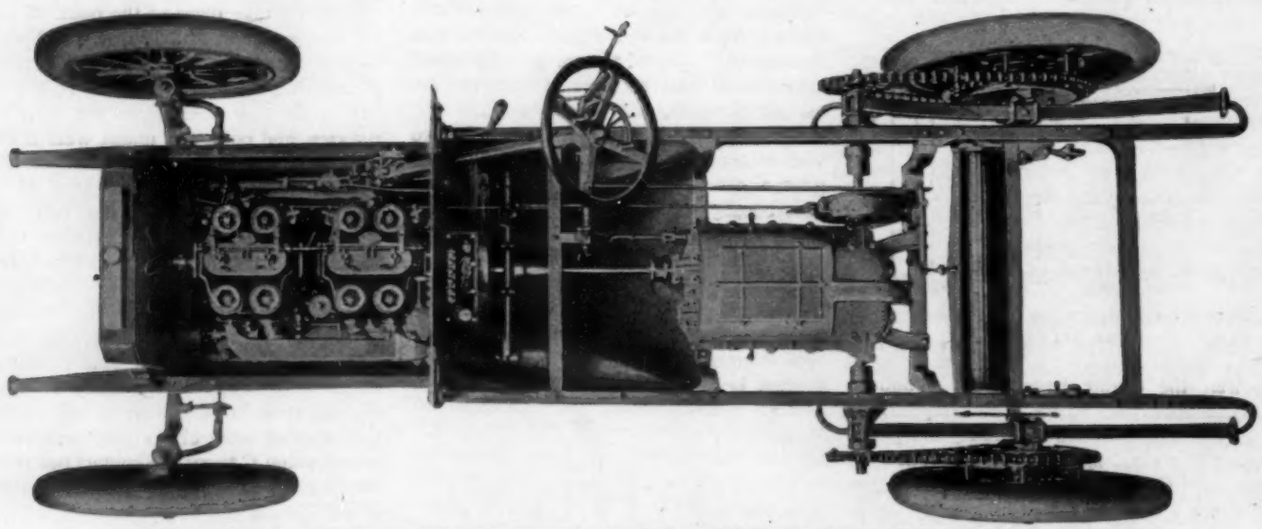
The efficiency of a gasoline engine depends largely upon the compression of the charge. The higher the compression the greater the efficiency. Now, while the compression of a charge of gasoline vapor is limited by the danger of pre-ignition, the alcohol engine cannot be run satisfactorily at less than ten atmospheres (150 pounds) compression, and fifteen atmospheres will give much better results. The maximum compression for a gasoline motor may be placed at something like six atmospheres (90 pounds).

Using gasoline or other fuel that splits up into lower hydrocarbons, soot deposits are bound to occur under some conditions, and this soot, remaining incandescent after the explosion, ignites the next incoming charges and causes what is known as pre-ignition. With alcohol, if the cylinder is polished and there are no protuberances to get red-hot, the alcohol motor can be run on fifteen atmospheres without pre-ignition, as it will cause no deposit of soot. The starting of a large motor working at such high compression can easily be effected by mechanical means for reducing the compression while cranking—for instance, by fitting a special set of cams for the purpose.

The Advantages of Alcohol.

One of the advantages of alcohol is that in case it becomes ignited it can be extinguished with water, either fresh or salt. Gasoline will float on top of water and continue to burn, and must be extinguished with sand or other solid substance, but alcohol will mix with water and has a certain affinity for it. Therefore, the mixture of water with alcohol will reduce its burning power, and when the dilution reaches something like fifty per cent. the alcohol will refuse to burn. In submarine vessels in which gasoline motors are used, the fumes of gasoline are greatly feared; alcohol would not give this trouble.

The greatest obstacle to the progress of alcohol motor development is the fact that in many countries the internal revenue on alcohol is so heavy as to practically prohibit its use as a motor fuel. There are many firms making alcohol motors in Germany, where alcohol is cheap, but in England alcohol is made under such heavy government restrictions that the price is prohibitive. Alcohol is regarded in the light of an extremely potent intoxicant, and its manufacture is accordingly restricted, but in Germany, France, Italy, Russia, Chili, Mexico, Brazil and other countries a more liberal view is being taken. Alcohol can be denaturized (rendered unfit for drinking) as soon as it is produced, but the British Government seems to overlook this fact.



FOUR CYLINDER 16 H.P. PEUGEOT CAR USED IN MAKING EFFICIENCY TESTS OF TRANSMISSION GEARING.

* From a paper by Dr. Ormandy before the Western Section of the Scottish Automobile Club.

At the conclusion of the lecture, a discussion on the subject of alcohol as fuel for explosion motors was opened by Mr. Napier, who stated that in the course of experimental work he found that he could obtain alcohol from a distillery about a shilling a gallon cheaper than he could buy gasoline; but he also found that naphtha or, as the lecturer called it, benzol, could be purchased at a still lower figure. After making experiments with a mixture of half alcohol and half benzol, Mr. Napier went back to benzol, which he has continued to use ever since when it was possible to obtain this fuel. He found that clogging of the valves and sooting of the plugs did not occur any quicker with benzol than with gasoline, and that benzol would carry a car weighing 2,100 pounds a distance of twenty-eight miles to a gallon, better than most cars would run on gasoline.

In replying to this the lecturer agreed with Mr. Napier that in some districts it might be possible to obtain benzol at prices that would enable it to compete with gasoline; but that as the supply was limited, the price would naturally go up out of all reasonable bounds as soon as the demand became large.

Mr. Weir expressed disappointment that the lecturer had made no reference to heavy oil as a motor fuel; he believed that this fuel would be particularly interesting to marine engineers, whose objections to more volatile fluids are well known. In reply to this the lecturer explained that there are very great difficulties in the way of using heavy oi as fue for high-speed engines; and even if these difficulties are finally overcome, it must still be admitted that heavy oil is nothing but a mixture of paraffins, and is subject to all the disadvantages to which the paraffins are subject as fuels. It is a mixture of a number of different substances; it has a very low range of explosibility; it deposits soot very easily, and it cannot be worked under high compression.

Alcohol for stationary purposes is out of the question, said Dr. Ormandy. Coal can be bought cheaply almost anywhere, and with a suction producer, a gas engine can be run far more cheaply than with any of the available liquid fuels.

Alcohol should be the fuel for tropical and semi-tropical countries, for it can be easily and rapidly produced from the many sugary and starchy matters which grow so profusely in hot climates, and alcohol, with its low vapor tension, could be used where any fluid much more volatile would be so readily evaporated as to be almost out of the question.

In reply to a question as to the chemical composition of naphtha and benzol, the lecturer stated that benzol is the name given the pure chemical substance, while naphtha is a mixture of two or three hydrocarbons. The use of chemically pure benzol is out of the question; what is furnished is naphtha, a mixture of benzol and one or two chemical substances closely allied to benzol. In speaking of benzol throughout the lecture naphtha was meant.

The New Michigan Law in Full.

Probably the Most Liberal Registration and Speed Measure Yet Enacted—Some of Its Unusual Features.

HEREWITH is reprinted in full the text of the Holmes automobile registration and speed bill which passed the Michigan Senate on May 24 and was passed by the House on the following day. It now only awaits signature by the governor to become effective. The bill was originally introduced in the Legislature by Representative Holmes on January 12. It was reported by the Committee on State Affairs to the House on March 17, after having been much amended, and was passed by the House on March 30. Then it went to the Senate, and after passage was referred to the House for concurrence.

During the long time the measure was before the Legislature much interest was taken in it by the automobile interests of the State, particularly by manufacturers and dealers in Detroit, to whose earnest representations before the legislators in Lansing are due the great modifications that were made in the original bill, which was very drastic and which, if it had been passed, would doubtless have worked considerable damage to the industry, that is rapidly becoming one of the foremost in Michigan.

In its final form the law differs in many respects from all others, and may be considered the most liberal of all such laws. For instance, the speed limit in cities and villages outside of the business portion is fifteen miles an hour, and beyond the corporate limits of cities and villages the maximum limit is twenty-five miles an hour. A special section in the law gives local authorities the right to grant permits for the holding of speed tests and races on the roads, under certain conditions to insure the safety of other users of the highways. The rules of the road are incorporated in the measure and bear equally upon all users of the road, except that there are a number of special provisions, as is usual in all such automobile laws, requiring the automobilist to stop when a horse shows fright and to lend all reasonable assistance in case of accident or threatened accident.

Attention is called to one clause in the rules of the road as given in the law that is directly opposed to the usual practice and law of the road and which seems to be an error or oversight. It is contained in Section 17, and provides that the driver of any vehicle, when overtaken by an automobile whose driver signifies a desire to pass, shall "turn to the *left* of the center of the wrought or traveled portions of the highway * * * ." The accepted custom throughout the country is for the overtaken vehicle to pull out to the *right* and allow the overtaking vehicle to pass on the left. This clause may lead to some confusion, and, in case of an accident, might result in a verdict of heavy damages against a well-meaning owner of a car.

Another point in the law that was being discussed by the lawyers in the lobby at Lansing just after the passage of the measure and before the Legislature adjourned is contained in Section 26, which, among other things, provides that if a hearing cannot be had at once before a magistrate when the driver of an automobile is arrested, the offender may "be released from custody on giving his personal undertaking to appear in answer of such violation, at such time and place as shall then be indicated, secured by the deposit of a sum equal to the maximum fine for the offense with which he is charged, or, in lieu thereof, by leaving the motor vehicle, being operated by such person, with such officer"; or, if the magistrate is not accessible, by giving his name and address to the officer making the arrest and depositing with the officer such a sum or the automobile.

Lawyers point out that this is an unconstitutional and invalid feature because it permits the purchase of liberty for other than lawful bail.

A BILL

To provide for the registration and identification of motor vehicles, the registration of chauffeurs, to regulate the use of motor vehicles and the use of public highways by such vehicles and persons passing such vehicles, and to provide penalties for the violation thereof.

The people of the State of Michigan enact:

SECTION 1. The term and words "motor vehicles" used in this act shall be construed to mean all vehicles propelled by power other than muscular power, except traction engines and such motor vehicles as run only upon rails or tracks; the term and words "highway" or "public highway" shall be construed to mean any public highway, township, county or state road, or any country road, any public street, alley, park, parkway, driving or public place in any city, village or town; the term and words "business portion of any city or village" shall be construed to mean the territory of a city or incorporated village contiguous to a public highway which is at that point either wholly or partially built up with structures devoted to business. The term and word "chauffeur" for the purpose of this act shall mean any person operating a motor vehicle as mechanic, paid employee or for hire.

SEC. 2. Every person now owning or hereafter acquiring a motor vehicle, shall, for every vehicle owned by him, file, in the office of the Secretary of State, a statement containing his name and address, with a brief description of the vehicle so owned by him to be registered, including the name of the maker, factory number, style of vehicle and motor power, on a blank to be prepared and furnished by said Secretary of State for that purpose. Upon the filing of said statement as aforesaid, said Secretary of State shall register such motor vehicle in a book or index to be kept for that pur-

pose, and assign it a distinctive number, and shall forthwith issue and deliver to the owner of such motor vehicle a certificate of registration together with a seal of aluminum or other suitable metal, which said seal shall be circular in form, approximately two inches in diameter, and shall have stamped thereon the words "Registered Motor Vehicle No. ...., Michigan Motor Vehicle Law," with the registration number inserted therein, which said seal shall thereafter at all times be conspicuously displayed on the motor vehicle to which such number has been assigned. The said certificate of registration shall contain the same words and number as the seal, and shall further contain the name of the owner of the vehicle so registered as aforesaid, his address, the name of the maker of the said vehicle, factory number, style and motor power, the date of registration and the liber and page of the book in the secretary's office in which the same is registered. For the registration and issuing of such certificate and seal, a fee of two dollars shall be paid to the Secretary of State.

SEC. 3. Upon the sale of a registered motor vehicle, registered in accordance with the above section, the vendor shall return to the Secretary of State within ten days from the date of such sale, his said certificate and seal, and in lieu thereof, upon the application by the vendee, the Secretary of State shall issue to said vendee a new certificate and seal containing the number of such previous registration, and such vendee making such application shall pay to the said secretary a fee of one dollar.

SEC. 4. In addition to the conspicuous display of the seal as provided in Section 2 of this act, it shall be the duty of the owner of each and every motor vehicle, at all times, to have displayed upon the rear of such vehicle in such a manner as to be plainly visible, the number assigned to it by the Secretary of State, said numbers to be in Arabic numerals, black on white ground, or white on black ground, and not less than three inches in height, and each stroke to be of a width not less than one-half inch, and also as a part of said number the name of the state in full or abbreviated, and of the same color and on the same ground as the numerals, the letters of the name to be not less than one inch in height. There shall also be displayed upon every motor vehicle in use upon any public highway during the period from one hour after sunset to one hour before sunrise, two lamps in the front of said motor vehicle, showing a white light visible within a reasonable distance in the direction which such vehicle is proceeding, and also a red light in the rear of said motor vehicle and visible for a reasonable distance in the reverse direction.

SEC. 5. No motor vehicle shall be used or operated upon the public highway after thirty days after this act takes effect which shall not display thereon a registration seal, and on the rear of said motor vehicle a number as provided in Section 4 of this act; or which shall display thereon a fictitious seal or number, or a seal or number belonging to any other vehicle.

SEC. 6. A manufacturer of or dealer in motor vehicles shall register one vehicle of each type manufactured or dealt in by him, and be entitled to as many duplicate registration seals for each type or style so manufactured or dealt in as he may desire, on payment to the said Secretary of State of an additional fee of fifty cents for each duplicate seal. If a registration seal and the corresponding number shall thereafter be affixed to and displayed on every vehicle of such type or style as in this act provided, while such vehicle is being operated upon the public highway, it shall be deemed a sufficient compliance with Sections 2 and 4 of this act, until such vehicle shall be sold or let for hire.

SEC. 7. The provisions of Sections 2 and 4 shall not apply to motor vehicles owned by non-residents of this state, providing the owners thereof have complied with the law of their respective state, territory or federal district, or foreign country, requiring the registration by owners of motor vehicles, and who shall have displayed upon their motor vehicle the registration number and name or initial of their state substantially as in this act provided. Provided, however, that such territory, federal district, or foreign country extends similar privileges to motor vehicles registered under this law.

SEC. 8. Every person hereafter desiring to operate a motor vehicle as a chauffeur shall file in the office of the Secretary of State, on a blank to be supplied by said Secretary, a statement which shall include his name and address and the trade name and motive power of the motor vehicle or motor vehicles he is able to operate; and he shall pay a registration fee of one dollar to the Secretary of State. The said Secretary shall thereupon file such statement in his office, register such chauffeur on a book or index to be kept for that purpose and assign him a number, and shall deliver to him a certificate of registration, which shall have written therein his or her name and address and the words "Registered Chauffeur No. ...., Michigan Motor Vehicle Law," with the registration number and the name of the motor power of the vehicles said chauffeur is able to operate and the date of registration and the liber and page of the book in the Secretary of State's office in which such registration is recorded.

SEC. 9. No chauffeur having registered as provided in the foregoing section shall voluntarily permit any other person to use his or her certificate, nor shall any person while operating a motor vehicle use any certificate belonging to another person, or a fictitious certificate.

SEC. 10. No person shall operate a motor vehicle upon the public highway after thirty days after this act takes affect, unless such person shall have complied in all respects with the requirements of this act.

SEC. 11. All fees paid to the Secretary of State as provided in this act shall be applied toward the expense of registration blanks, books and seals, as herein provided to be furnished: Provided, That the surplus shall be applied to the furthering of good roads for the benefit of the state at large.

SEC. 12. No person shall operate a motor vehicle upon a public highway at a rate of speed greater than is reasonable and proper, having regard to the traffic and use of the highway, or so as to endanger the life or limb of any person, or the safety of any property; and shall not in any event while upon any highway run at a higher rate of speed than twenty-five miles an hour, and within the corporate limits of all cities and villages the rate of speed shall not be greater than eight miles an hour in the business portion of any such city or village, and not greater than fifteen miles an hour in all other portions thereof, subject, however, to the other provisions of this act.

SEC. 13. Upon approaching an intersecting highway, a bridge, dam, sharp curve, or steep descent, and also in traversing such intersecting highway, bridge, dam, curve or descent, a person operating a motor vehicle shall have it under control and operate at such speed as is reasonable and proper, having regard to the traffic then on such highway and the safety of the public.

SEC. 14. Upon approaching a person walking in the roadway of a public highway, or a horse or horses, or other draft animals, being ridden, led or driven thereon, a person operating a motor vehicle shall slow down to a speed not exceeding ten miles an hour and give reasonable warning of its approach, and use every reasonable precaution to insure the safety of such person or animal, and in case of a horse or horses or other draft animals, to prevent frightening the same.

SEC. 15. Any person operating a motor vehicle shall, at request or signal, from a person riding, leading or driving a horse or horses, or other draft animals, guide such motor vehicle to the right of the wrought or traveled portion of the highway, and immediately bring such motor vehicle to a stop, and if requested, shall cause the motor of such vehicle to cease running so long as shall be reasonably necessary to prevent accident and insure the safety of others. And it shall also be the duty of any male chauffeur or driver of any motor vehicle, and other male occupants thereof, over the age of fifteen years, while passing any horse or horses or other draft animals which appear badly frightened, or upon the request of the person in charge of and driving such horse or horses or other draft animals, to give such personal assistance as would be reasonable to insure the safety of all persons concerned and to prevent accident.

SEC. 16. Whenever a person operating a motor vehicle shall meet on a highway any other person riding or driving a horse or horses or other draft animals or any other vehicle, and there being no occasion to stop as above provided, the person operating such motor vehicle shall seasonably turn the same to the right of the center of the traveled portion of the highway; while the person approaching shall likewise turn from the center of the traveled portion of the highway so as to pass the motor vehicle on the opposite side of the center of the highway to which the motor vehicle has been turned. And any person so operating any motor vehicle shall, at the intersection of a public highway, keep to the right of the intersection of the centers of such highways when turning to the right and pass to the right of such intersection when turning to the left.

SEC. 17. If a vehicle drawn by a horse or horses or other draft animals, or a motor vehicle, be overtaken by any motor vehicle, and the person in charge of such motor vehicle expresses a desire to pass, it shall be the duty of the driver of any such vehicle or motor vehicle so overtaken as aforesaid, to turn to the left of the center of the wrought or traveled portion of the highway, and give the person so making the request an opportunity to pass, but in passing, the person in charge of such motor vehicle and the other male occupants thereof over the age of fifteen years shall give such assistance as they are able to the occupant or occupants of the vehicle they are passing, if assistance is asked, and in thus passing the chauffeur shall use all due care to avoid accidents.

SEC. 18. In case of accident to person or property upon any public highway, due to the operation thereon of any motor vehicle, the person operating such motor vehicle shall stop, and give such reasonable assistance as can be given, and shall, upon request of the person injured, or any other person, give such person his name and address, and if not the owner, the name and address of the owner of such motor vehicle, together with the registered number thereof.

SEC. 19. Local authorities, notwithstanding the provisions of this act, may set aside for a given time, a specified public highway for speed tests or races, to be conducted under proper restrictions for the safety of the public, providing such local authority shall, for six weeks prior to the date of such speed tests, give public notice by due publication in a newspaper published and circulating in the county where such speed tests are to be made, and if in more than one county, in one paper in each county in which such public highway runs where such tests are to be made, and shall also post notice of such event along said public highway in at least one conspicuous place every quarter of a mile for the entire distance, at least three weeks prior to the date of said event, such notices to be printed in type of sufficient size as to be readable by persons passing along such highway, all of such notices thus posted to be kept up and in place during the time preceding the date of such speed tests.

SEC. 20. Subject to the provisions of this act, local authorities shall have no power to pass, enforce or maintain any ordinance, rule or regulation requiring of any owner or proprietor of a motor vehicle any license or permit to use the public highways, or excluding or prohibiting any motor vehicle whose owner has complied with the provisions of this act from the free use of such highways, except such driveway, speedway or road as has been or may be expressly set apart by law for the exclusive use of horses and light carriages, or that shall in any way affect the registration or numbering of motor vehicles or prescribing a greater rate of speed than is herein specified at which such vehicles may be operated, or the use of the public highways, contrary to or inconsistent with the provisions of this act; and all such ordinances, rules or regulations now in force are hereby declared to be of no validity or effect.

SEC. 21. Local authorities may, notwithstanding the provisions of this act, make, enforce and maintain such reasonable ordinances, rules or regulations concerning the speed at which motor vehicles may be operated in any park or parkway within a city or incorporated village, but in no case to permit a greater speed than is provided in this act, and as a condition thereto, such local authorities must, by signs at each entrance of such park and along said parkway, conspicuously indicate the rate of speed permitted or required and may exclude motor vehicles from any cemetery or grounds used for the burial of the dead.

SEC. 22. Nothing in this act shall be construed to curtail or abridge the right of any person to prosecute a civil action for damages by reason of injuries to person or property resulting from the negligence of the owner or operator, or his agent, employee or servant, of any such motor vehicle, or resulting from the negligent use of the highway by them or any of them.

SEC. 23. Any person violating any of the provisions of this act and who shall be convicted thereof, or who shall plead guilty to any complaint for the violation thereof, shall be punished by a fine not exceeding twenty-five dollars and costs of prosecution, or if such fine is not paid then by imprisonment in the county jail for not exceeding ten days; for the second offense he shall be punished by a fine not exceeding fifty dollars and costs of prosecution, or if such fine is not paid then by imprisonment in the county jail for not exceeding twenty days; and for a third, or any subsequent offense, he shall be punished by a fine not exceeding one hundred dollars and costs of prosecution or by imprisonment in the county jail or the Detroit House of Correction for a period not exceeding thirty days, or by both such fine and imprisonment.

SEC. 24. All police justices of any city, or justices of the peace of any township, where any such violation shall occur, shall have jurisdiction to hear, try and pass sentence for any and all violations of any of the provisions of this act.

SEC. 25. The term county jail referred to in Section 23 of this act shall be construed to mean the county jail of any county where the violation of any of the provisions of this act shall occur, and the Detroit House of Correction shall be construed to mean the institution of that name located in the city of Detroit, this state.

SEC. 26. Any police officer of any city; any marshal, deputy marshal or watchman of any incorporated village; or any sheriff or deputy sheriff of any county or any constable of any township, shall have full power and authority within the limits of their jurisdiction or in any adjoining county to arrest any person known personally to any such officer to have violated any of the provisions of this act, and to immediately bring such offender before any magistrate having jurisdiction, as provided in Section 24 of this act, and any such person so arrested shall have the right of an immediate trial and all other rights given to any person arrested for having committed a misdemeanor; and if such hearing cannot then be had, be released from custody on giving his personal undertaking to appear in answer for such violation, at such time and place as shall then be indicated, secured by the deposit of a sum equal to the maximum fine for the offense with which he is charged, or in lieu thereof, by leaving the motor vehicle, being operated by such person, with such officer; or, in case such officer is not accessible, be forthwith released from custody on giving his name and address to the officer making such arrest, and depositing with such officer a sum equal to the maximum fine for the offense for which such arrest is made, or in lieu thereof, by leaving the motor vehicle, being operated by such person, with such officer: Provided, That in such case the officer making such arrest shall give a receipt in writing for such sum or vehicle and notify such person to appear before the most accessible magistrate, naming him, on that or the following day, specifying the place and hour. In case security shall be deposited, as in this subdivision provided, it shall be returned to the person depositing, forthwith on such person being admitted to bail.

Sec. 27. All acts and parts of acts inconsistent herewith or contrary hereto, so far as they are inconsistent or contrary, are hereby repealed.

GOOD FIELD FOR STAGE LINES.

Special Correspondence.

SAN FRANCISCO, June 11.—An automobile stage line is to be established between Marysville and the new town of Hammon, both in this state, near the head of the Sacramento Valley. The section is somewhat mountainous and offers a good chance for competition with the two stage lines now running. Hammon is a new center for dredger mining, and is building up as a lively and prosperous community.

Automobile stage lines are being started in a number of places in California and Nevada, in mountainous or desert sections, but so far the attempts have generally been made with touring cars. There is a good opportunity in this section to introduce properly built cars for this purpose. In many instances it is not a matter of speed so much as power, this being particularly the case in the mountainous districts. The touring cars have pioneered the field, and have demonstrated the possibility of profitably competing with the horse-drawn stages, and the company that comes into the field with a car especially constructed for the purpose will secure a profitable and growing business. The conditions in California are such that on the roads on which automobile lines would be placed there is no danger from rail competition for very many years.

Foreign News Notes.

The first stage in the transformation of the Paris 'bus service was the public trial recently of a Serpollet steamer in the streets of the capital. The vehicle is of 40-horsepower, but capable of developing as much as 100-horsepower. The body work is built on existing models, the only difference being that the top is covered. In every respect the trials were a complete success. For 2 hours 40 minutes, including stoppages for inspection, the 'bus ran over twenty-one or twenty-two miles of the most difficult streets of Paris, ascending hills with a grade of 17 per cent. with the utmost ease. On the level the pressure varied from 6 to 8 kilos, mounting up to 14, 20, 30 and 50 kilos in the most hilly quarters of the city. The Omnibus Company is favorably disposed towards steam, and will doubtless adopt this form of engine if it is found to be as economical as the gasoline motor. The French agents of the White steamer have been invited to enter a car for trial. Experiments will next be made with different makes of gasoline cars.

A striking difference between the advertising methods of the two nations is shown by the fact that while any number of automobile catalogues can be had in the United States for the asking, in France they are often sold at from 16 to 20 cents each. The Darracq firm has just announced an advertising scheme not lacking in originality. In order to establish a popular type of car to be sold in large numbers to those taking up automobilism more for business purposes than for pleasure, a list has been drawn up consisting of fourteen questions, to which replies are requested. These treat of number of seats, speed desired, number of cylinders, sparking arrangements, size of wheels and nature of tires, body work, total weight, and finally the price at which such a vehicle should be sold. The replies will be classified and the 1906 model based on the opinion expressed by the majority of competitors. First prize will consist of one of the 1906 model automobiles, built as a result of the competition, and will be awarded to the competitor arriving the nearest to the type adopted.

One Year's Commercial Vehicle Trials.

Conducted in Porto Rico Over a Distance of 54 Miles Carrying Passengers, Mail and Baggage—Splendid Results and Profits.

By C. H. MARTIN, Traffic Manager.

CAMUY, Porto Rico, June 7.—That the automobile as a commercial vehicle has reached the point where it can compete successfully with the horse I think we have proved by our work down here in Porto Rico; and to those who contemplate turning the old horse out to pasture and substituting the automobile, a narration of some of our experiences may not be without interest and value.

The automobile's reputation for speed has been established, and a few endurance contests lasting a week or so, and sometimes held under adverse circumstances, have shown the automobile to be a fairly reliable vehicle. Several machines have crossed the American continent, but even that does not convince the merchant, who hesitates about investing thousands of dollars in machines that he thinks are largely in the experimental stage; but I think he can hesitate no longer when he learns what the auto has done for us in actual service.

We have been operating a stage line in the western part of the island of Porto Rico, over a distance of fifty-four miles—twenty-seven miles each way—completing a gap in the railroad over a section so rough and hilly that the great expense involved has deterred the American Railroad Company from building its line here.

Our work is to take passengers from the North Railroad terminus to the end of the South Railroad, and bring back passengers, mail and baggage. For the trip we have five hours and twenty minutes—when the trains are on time, which is not always. We have been operating the line just a year now, without having missed a single day, and have carried 7,442 passengers. Not a passenger has been hurt in any way and not a domestic animal killed.

We have four machines, all of the same make—the waterless Knox; three are used for passenger and mail service. Two of these are of 8 horsepower with seats for eight passenger each, besides the operator; the third is driven by a 20-horsepower double opposed motor, and is fitted with a body designed to carry fourteen passengers and the operator. Our fourth machine is used as an "emergency wagon," and is always kept loaded with parts and tools, so that upon receipt of a telegram that something has gone wrong on the road, the repair wagon can be on the way to the scene within a minute after the message is received. And, as it is geared rather high, it does not take long as a rule to reach the cripple. Then, if the trouble means a delay of an hour or two, the passengers and baggage are transferred to the "emergency wagon," which continues the trip while the broken-down machine is being repaired right there on the road.

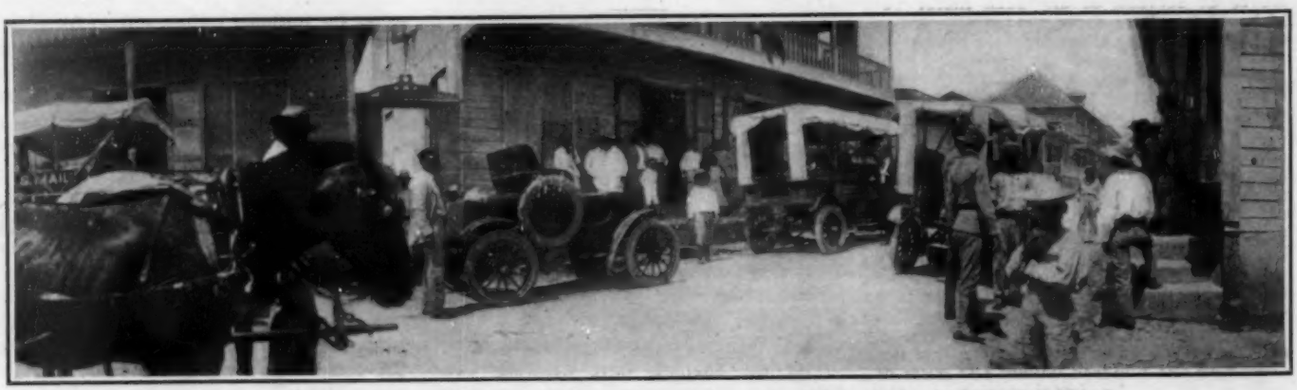
Only once have we had to call on outside assistance. That was when a crankshaft broke and we did not have an extra one, so that we were obliged to make use of a team of friendly oxen. Every other time the machine has come in on its own power.

We have had troubles, of course, many of them, and it is not to be wondered at, as we are compelled some days to carry very much more weight than the machines were built to carry. One day the two eight-passenger cars each had a full load with extra heavy baggage and mail, and the fourteen-passenger wagon which had nineteen passengers crowded into it, was drawing a two-wheeled trailer weighing 1,000 pounds and loaded with 1,500 pounds of baggage and mail. When vehicles have such a strain put on them it is not to be wondered at that now and then a part gives way.

For part of the distance between the two railroad termini the road is very bad and we have to pound over boulders and ruts and run through deep sand. This, of course, intensifies the strains, and the vibration caused by the solid tires crystalizes the axles and as originally designed they break. But that trouble we have overcome. Our old axles were turned down to 1 3-4 inches in diameter where they left the differential, to telescope in a heavy sleeve. The break always occurred just at the shoulder, so we had new axles made that were 2 inches in diameter from end to end, and bored out the sleeves to fit them, and now we have no more trouble, the stresses being equally distributed.

The solid tires which we used at first were evidently not adapted to our roads and climate, as they cut all to pieces on the sharp stones, which would bite pieces right out until the tires looked like saw edges. However, we got about 2,000 miles' use out of a set. Then we tried puncture-proof, semi-pneumatic tires on one car, but got only 600 miles out of them, the tread stripping right off of the canvas—possibly owing to the very heavy loads carried, or to the hot, moist climate. Finally our fourteen-passenger car was equipped with 4-inch Firestone side wire solid tires and these ran for 7,300 miles, when we replaced them with a new set of the same kind that are wearing better than the first set, having run now 4,800 miles and showing very little wear. As they did such good work, we equipped the eight-passenger rigs with the same make, but of 3 inches diameter, and these have run 6,200 miles, and are good for as many more. There can be no question, however, that any solid tire is harder on a machine than pneumatics, and if it were not that we have to maintain a schedule, I would take the pneumatic and all its troubles except for the big car, which is built so heavy that the vibration makes little difference.

We have had scarcely any trouble with the big vehicle. One crankshaft broke and one cylinder cracked in the first 1,000 miles; since then she has been making her run every day and giving no trouble whatever. Most of our trouble is with the smaller machines that were built to carry five persons including the driver, and to use pneumatic tires, but we had bodies built to carry nine including the driver and a rack attached to carry trunks, grips and mail sacks. There are many times when



A GLIMPSE OF LIFE IN A PORTO RICO TOWN BEFORE THE START OF THE KNOX AUTOMOBILE STAGE.

A HALT FOR A SNAPSHOT ON A TYPICAL STRETCH OF ROAD IN THE PORTO RICO AUTOMOBILE SERVICE.

these have their full load of passengers and 500 pounds of baggage besides.

As we are three weeks from the factory, there are times when we have to make sight drafts on our ingenuity. Once the lower leaf of one of the big side springs gave way and it was impossible to proceed without fixing it. We had no rope or wire to bind it, and were at the most remote point on the road from a telegraph station, with a load of passengers for the steamer that was to sail for "the States" the following day. A crowd of natives collected and one of them, seeing our trouble, darted into the woods and returned with a vine such as is commonly used here by the natives in place of rope and twine. With this we bound up the spring and were able to catch the train.

Wet batteries, broken spark plugs and clogged carbureters are minor troubles that every automobilist is familiar with and it is not necessary to dwell upon them.

Once we burned the babbit metal out of a connecting rod owing to the neglect of the operator to give the bearing oil. For a time the driver was up a stump. One of the passengers asked if he had ever tried leather for a bearing. It was a new "stunt" to the operator—and besides, he had no leather. However, it was necessary to do something, so he cut the soles from both his shoes and fitted pieces of the leather into the bearing and got in on time for the train. Nevertheless, the writer does not recommend leather for bearings.

At first we had some difficulty in getting good help, but we have taught several of the natives to drive and now have five good men.

I was somewhat skeptical at first about the air-cooled engine being able to do our work, but am now satisfied that it is the only system for commercial work even where it is sometimes necessary to work an engine to its fullest capacity for a long time, as we do here. Our engines are cooled, as is well known, by threaded pins screwed into the cylinder, the pins providing thirty-two square inches of radiating surface for each square inch of inside cylinder wall. With this system we can take the long grades with a full load without overheating, and I think have settled for all time any doubt that even in the hottest weather we have here the air-cooled engine is not only as good as, but much more convenient than, the water-cooled system.

When we started our line there were thirty-two horse-drawn coaches, each seating four persons, doing the work our three machines are now doing. I say "doing the work," but should say doing half the work, for the travel has more than doubled since we began giving so much quicker service. The coaches died hard; the owners cut the fare in half and of course got some business, but the old coaches have all left the route now except three, which continue to get some business as there are some persons who are still afraid of the automobile.

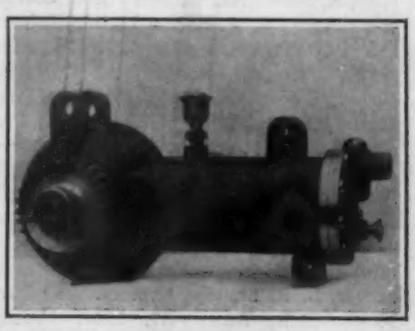
We started in to keep an account of the total cost per mile of operation for each machine, but the boys got things mixed so we can only strike an average estimate by taking into consideration the cost of all the gasoline used, the cost of tires and parts we have bought, a fair per cent. of depreciation in machines and dividing the total by the mileage. Thus, we find the cost to have been 5 1-4 cents per mile for each car, exclusive of chauffeurs' wages. In the States the cost would be considerably less because of the lower price of gasoline, the relatively lower cost of reaching the factory by wire and the lower express charges on parts.

In the face of all our competition, our troubles during the first few months with tires and breakages and the natives' fear of the automobiles, we shall pay a dividend on this first year's business of 25 per cent. We have increased our holdings, extra parts, and tools about 40 per cent., and have no complaints to make regarding the automobile as a commercial vehicle. Our work here was in the nature of an experiment and we are so well satisfied that within a few months, we shall have five twenty-passenger vehicles and ten five-ton trucks running on the great military road that crosses the island, connecting the two largest cities—San Juan and Ponce.

Dr. Spencer was called up from Montrose Sunday by some of his patients. He made the trip in his automobile.—Salem, S. D., *Special.*

Air Pump for Car.

A new air-pump designed for the inflation of automobile tires, has been brought out by J. C. Bonnett, of New Haven, Conn., and is intended to be driven by gear from the motor of the car. The illustration shows the outward appearance of the little machine, which weighs but eight pounds, and is said to be capable of filling a thirty by three and a half inch tire to a pressure of eighty pounds in one minute. The pump is made with a trunk piston packed with rings like a motor piston; lubrication is by splash from the crank case, and an oil pocket



BONNETT AUTO AIR PUMP.

is formed in the cylinder wall, the piston dipping into the oil at every stroke. A bronze connecting rod is fitted with means for adjustment when worn; the crankshaft is of steel. Each pump is furnished complete with tubing long enough to reach any tire on the car; a pressure gauge for indicating the air pressure as the pumping proceeds; attachments for applying the pump to cars of different models; and means for throwing it in and out of gear. On large cars the pump may deliver into a receiver, from which air may be taken for the tires, for blowing the horn and other purposes.

As a result of an experiment by F. J. Linz, Pacific Coast agent for the Rambler, it is probable an automobile line will be established between Wadsworth and Olinghouse, Cal. Mr. Linz was the first person to take an automobile through the White Horse district.

Hartford Club's Meet at Charter Oak Track.

Special Correspondence.

HARTFORD, June 17.—The two days' meeting that ended here to-day was a good example of what a local automobile club can do in the way of stimulating interest among its members and in promoting intercourse with outsiders. The meet was promoted by the Automobile Club of Hartford, and, although it was the first meet held on the Charter Oak track by the club, it proved very successful. While the racing events were, of course, the main features, the hospitality of the club was most enjoyable. One of the entertainment features was a banquet to the visitors, given Friday night, by the A. C. of Hartford in the Hartford Club building, followed by a smoker at the Allyn House for the officials, contestants, owners who had entered cars for the races, and other prominent automobile men, including representatives of the press. It was an informal affair and good fellowship reigned. Remarks were made by Colonel George Pope, A. L. Riker, Robert Lee Morrell, A. G. Batchelder and others. Luncheon was furnished the autoists in the clubhouse at the park during the racing. Most of the track officials were among the visitors. The list is as follows: Honorary Referee, Robert Lee Morrell, chairman A. A. A. Racing Board; Referee, Frank G. Webb, Long Island A. C.; Judge, A. G. Batchelder, secretary A. A. Racing Board; Timers, F. E. Moscovics, George Clark, James Holland, of New York; Umpires, L. J. Powers, A. C. of Springfield, and A. L. Hopkins, A. C. of Hartford; Starter, F. J. Wagner; Clerk of the Course, Harry C. Gillette, New Haven; Assistant Clerks of the Course, Edward Fahy, Hartford, and Herbert Seymour, Hartford; Scorer, L. R. Smith, Secretary New York Motor Club; Announcer, Peter Prunty, New York.

The committee representing the Hartford Automobile Club in connection with the meet was composed of J. Howard Morse, L. C. Grover, F. C. Billings, Leonard D. Fisk, W. T. Plimpton, and C. H. Gillette, manager, who was largely responsible for the success of the meet.

The track is a mile oval, with a fair surface and attractively located, the surrounding wooded hills and valleys giving the eyes a wide and restful sweep. The weather was bright and comfortable, and the occasion was really a social affair for automobilists and their friends residing here.

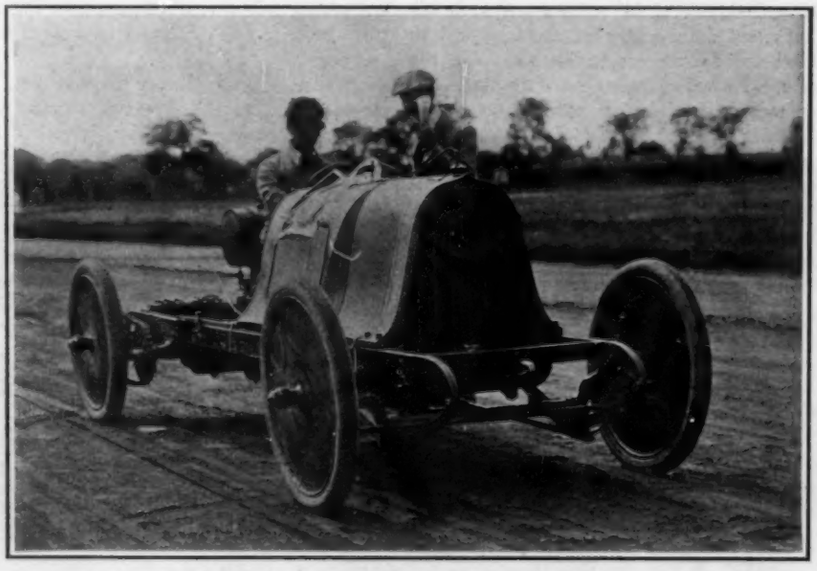
Interest in the racing centered largely, of course, in the meeting of Barney Oldfield, with his *Green Dragon*, and Louis Chevrolet, with Major Miller's Fiat, although there was great enthusiasm for local favorites, the Columbia drivers especially. With so many big racing cars undergoing repairs and alterations in the shops, there was a strong predominance of New England cars in the events. On the first day Chevrolet distanced Oldfield in the trial heat of the mile race. In the final heat Oldfield started out to get the drop on his rival and took the lead at the first turn. Barney was of the opinion that if he could get well in front at the turn and scatter a little dust behind him that the race would be his; but he was mistaken. Chevrolet showed a burst of speed on the back stretch and overtook the *Green Dragon* at the half-mile post. It was a pretty race around to the three-quarters, but Chevrolet steadily forged ahead and Oldfield couldn't catch him. The men were to meet in the championship race on the second day. A match pursuit race of five miles for $250 a side was fixed up, and when the flag was dropped Oldfield was off like a flash from in front of the judges' stand, but the Fiat didn't move, for a shaft was broken close to the gear box. The Italian had to pack up and go back to New York, and the crowd was disappointed. Referee Frank G. Webb declared it was no race because Chevrolet did not start, and the case was referred to the racing board.

The best race of the meet was the closing event of the first day, the five miles for stock cars selling at more than $3,000. It was nip and tuck all the way between Charles Soules in a 30-horsepower Pope-Toledo and E. C. Bald in a 35-40-horsepower Columbia. Bald showed in front for the first two miles, Soules was in the lead at the completion of the third mile, and Bald was about a foot in the lead at the fourth. Then Soules regained the lead on the backstretch and Bald made a hot race to the tape, but couldn't catch up.

L. H. Elmer, the local Rambler manager, protested the Knox 16-horsepower car that won the race for stock cars listed at $1,000 to $2,000. He claimed that the Knox car was fixed for racing and did not come within the specifications of the catalogued car. The Knox people claimed that it did, and said that one car just like the one that won the race had been sold and others could be had at any time. Messrs. Morrell, Webb, Riker and President J. Howard Morse, of the local club, heard the evidence submitted. Mr. Webb said he would ask the Knox Company for an affidavit, and if one was submitted the protest probably would be disallowed.

SOULES' OVERTURNED POPE-TOLEDO

George Soules had a hairbreadth escape while driving a Pope-Toledo in a special three-mile race with his brother Charles. The wheel caught in a rut in the track and the car turned two somersaults. The car was wrecked, but the driver escaped with a slight shaking up.



CHARLES SOULES IN THE 45-HORSEPOWER POPE-TOLEDO RACER AT HARTFORD.

Following are the summaries for the two days' events:

FRIDAY.

Corinthian mile, cars of all classes, driven by amateurs.—W. C. Russell, 10-horsepower Stanley, 1st; E. Hill, Jr., 35-40-horsepower Columbia, 2d. Time, 1:41.

Club Handicap, three miles, open only to A. C. of Hartford members; First heat—W. C. Russell, 10-horsepower Stanley, won in a walkover. Second heat—W. C. Walker, 30-horsepower Pope-Toledo, won in a walkover. Third heat—W. L. Ledger, 16-horsepower Franklin, 1st; H. P. Maxim, 16-18-horsepower Columbia, 2d; C. E. Walker, 16-horsepower Pope-Hartford, 3d. Time, 4:50. Fourth heat—E. C. Bald, 35-40-horsepower Columbia, 1st. Time 4:23.

Final heat—George Soules, 30-horsepower Pope-Toledo, 7 sec. handicap, 1st; E. C. Bald, 35-40-horsepower Columbia, scratch, 2d; C. S. Henshaw, 40-horsepower Thomas, scratch, 3d. Time, 3:35 1-5.

Free-for-all, one mile.—First heat—Louis Chevrolet, 90-horsepower Fiat, 1st. Time, 1:03 2-5. Barney Oldfield, 60-horsepower Peerless, 2d. Time, 1:05. Second heat—Charles Soules, 45-horsepower Pope-Toledo, 1st. Time, 1:08. Montague Roberts, 60-horsepower Thomas, 2d. Time, 1:15 2-5.

Final heat—Louis Chevrolet, 90-horsepower Fiat, 1st. Time, 1:03. Oldfield, 60-horsepower Peerless, 2d. Time, 1:04 3-5.

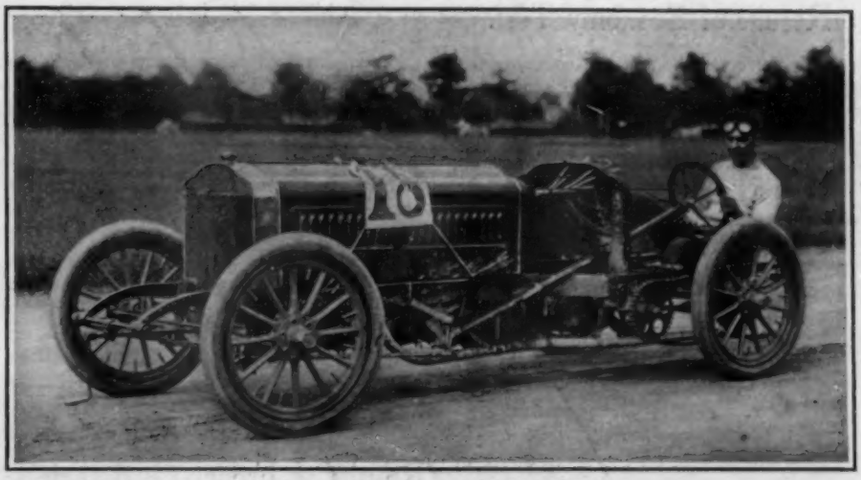
Five-mile motorcycle race.—Jacob DeRosiers, 1 3-4 horsepower Indian, 1st; Alexander Smith, 1 3-4 horsepower Indian, 2d. Time, 6:46.

Three miles for touring cars, drivers to line up with engines dead, start engines, run a mile, discharge passengers, run another mile and take on passengers, and finish race.—Charles Soules, 30-horsepower Pope-Toledo, 1st. Time, 4:55. E. C. Bald, finished first in a 35-40 horsepower Columbia, but was disqualified for not stopping at the end of the first mile.

Five miles for cars weighing 881 to 1,432 pounds.—A. Mann, 16-horsepower Knox, 1st; W. C. Russell, 10-horsepower Stanley, 2d. Time, 6:59 2-5.

Five-mile time trial by Oldfield.—Time, 5:03 3-5.

Five miles for stock cars listed at more than $3,000.—Charles Soules, 30-horsepower Pope-Toledo, 1st; E. C. Bald, 35-40-horsepower Columbia, 2d; George Soules, 30-horsepower Pope-Toledo, 3d. Time, 6:14.



HARRY HOUPT'S SIX CYLINDER 60-HORSEPOWER THOMAS CAR AT HARTFORD TRACK.

SATURDAY.

One mile for runabouts, regular stock cars listed at $1,000 or less.—L. H. Elmer, 16-horsepower Rambler, 1st; R. M. Alexander, 10-horsepower Pope-Hartford, 2d; F. E. Bowers, 7-horsepower Rambler, 3d. Time, 1:48.

Oldfield-Chevrolet five-mile match pursuit race for $250 a side.—Declared no race because Chevrolet could not get his car started.

Five miles for cars weighing 1,432 to 2,204 pounds.—Oldfield, 60-horsepower Peerless, 1st. Time, 5:26 1-5. A. M. Roberts, 60-horsepower Thomas Flyer, did not finish.

A. A. A. Championship, five miles.—Barney Oldfield, 60-horsepower Peerless, 1st, in a walkover. Time by miles, 1:02, 2:01 2-5, 3:01 3-5, 4:01 2-5, 5:01 2-5. This is five-mile record for the track. The second mile was made in 59 2-5 seconds, one mile record for the track.

One mile for stock cars listing at $1,001 to $2,000.—H. Raymond, 16-horsepower Knox, 1st, 1:24 3-5; A. E. Dennison, 16-horsepower Knox, 2d; H. P. Maxim, 16-18 horsepower Columbia, 3d. Time, 1:24 3-5.

Five-mile free-for-all, cars with track record of better than one mile in 60 seconds barred.—E. C. Bald, 35-40-horsepower Columbia, 1st, in a walkover.

One mile for stock cars listed at $2,001 to $3,000.—Peter Thompson, 40-horsepower Thomas Flyer, 1st; C. S. Henshaw, 40-horsepower Thomas Flyer, 2d. Time, 1:44 1-5.

Charter Oak Handicap, five miles, first heat.—H. Raymond, 16-horsepower Knox, 45 seconds handicap, 1st; E. C. Bald, 35-40-horsepower Columbia, scratch, 2d; A. E. Dennison, 16-horsepower Knox, 55 seconds, 3d. Time, 7:50 3-5. Second heat—C. S. Henshaw, 40-horsepower Thomas, scratch, 1st; James Daley, 16-horsepower Franklin, 50 seconds, 2d. Time, 7:59.

Final heat—H. Raymond, 16-horsepower Knox, 35 seconds, 1st; C. S. Henshaw, 40-horsepower Thomas, scratch, 2d. Time, 7:35.

THERY, WHO SECURED FIRST PLACE IN THE FRENCH ELIMINATION TRIALS FOR THE GORDON BENNETT RACE AT THE WHEEL OF THE WINNING CAR — M. BRASIER, DESIGNER OF THE CAR, STANDING BEHIND IT.—For details see next page.

Results of Economy Test.

After the conclusion of the economy test run of the Long Island A. C., which was held on June 10-11, the committee in charge of the event collected all the data and worked out the official results, confirming the statement given out tentatively that Dr. C. B. Parker had won, as announced in our last issue. Dr. Parker carried four passengers in a 10-horsepower Franklin car ninety miles at a total cost of $3.22, or at the rate of 80 1-2 cents for each passenger. This figure includes gasoline, lubricating oil, and repairs, but not, of course, hotel and other personal expenses or wear and tear on the machine. Two other competitors carried their passengers the round trip, Brooklyn to Southampton, on the south shore of Long Island, and return, for less than a dollar per capita, and all who finished the contest were well within the two-dollar mark for each person carried.

The fare charged by the Long Island Railroad for this trip, $4.53 for each passenger, was taken as a basis for making comparisons, and in every case the cost of going by automobile was very much below the railroad fare. A uniform scale of prices was adopted for the purposes of the contest; gasoline was charged at twenty-five cents a gallon; lubricating oil at sixty cents a gallon; tire repairs, fifty cents an hour; other repairs, sixty cents an hour; inner tube punctures, seventy-five cents; burst inner tube, seventy-five cents; changing tires, inflating and so on, fifty cents an hour; chain repairs, fifty cents an hour; parts and materials used in making repairs to be charged up at catalogue prices.

The run was made under almost ideal conditions; the weather was beautiful, the roads in excellent condition, because of recent rain, which had laid the dust, and laborers had been busy putting the surface in good condition. While these facts doubtless had a good deal of influence on the cost of running, it seems probable that even had the weather been distinctly unfavorable the cost would not have equaled that of railroad transportation. Though speed cut no figure in the contest, there was a good deal of racing among some of the participants, and one member was arrested and fined $25 at one of the villages passed en route; three of the cars made the outward run a race to see which should be first to arrive at Southampton.

A. R. Pardington, chairman of the touring committee of the Long Island A. C., was the donor of the trophy for the contest, and, therefore, made himself technically ineligible by carrying only three passengers instead of four, as he did not wish to be a competitor for his own prize. Stutz failed to qualify because of lack of human freight; Lefferts and Mrs. Seaman were overwhelmed with tire and other troubles, and were forced to withdraw; Palmer and Post left the route on the return trip and went on a little tour of their own. Some of the more important figures are given in the accompany table—see below.

Tabulated Results of Long Island Club's Economy Tests.

Entrant and Car	Gasoline, Gals.	Oil, Pts.	Repair Expense	No. of Passengers Carried	Cost per Passenger	Total Cost
Dr. C. B. Parker, 10 h.p. Franklin	9¾	7	.25	4	$0.805	$3.22
R. Healy, 30 h.p. Pope-Toledo	17¾	½		5	0.885	4.42
S. H. Burns, 18-h.p. Northern	14	6		4	0.9875	3.95
W. C. Damron, 8½-h.p. Cadillac	10¼	3	1.75	4	1.127	4.51
J. R. Parker, 15-h.p. White	20	3		4	1.31	5.24
C. A. Carlson, 16-h.p. Winton	19	7		4	1.32	5.28
C. J. Edwards, 18½-h.p. Cadillac	10	4		2	1.40	2.80
F. B. Stephenson, 25-h.p. Pope-Toledo	12	8		2	1.80	3.60
F. L. Wyckoff, 10-h.p. Cadillac				2	1.905	3.81
M. R. Greene, 15-h.p. White	25	3	1.15	4	1.91	7.64

CARDS MISSING.

August Post.

A. R. Pardington; technically withdrawn. Donor of cup.

A. W. Seaman; not in by 6:30 p. m.

Leffert Lefferts; did not complete itinerary.

Lowell M. Palmer; withdrew at Bay Shore on return.

Results of French G. B. Trials.

Thery, the winner of the 1904 Gordon Bennett race, won the French elimination trials, held Friday, June 16, on the Auvergne course. Curiously, too, his mechanician in the last year's Gordon Bennett also won a place in this year's trials—both driving Richard Brasier cars. The other representative of France in the great international race will be Duray, who drove one of the huge De Dietrich racers in the trials. According to the somewhat meager cable reports yet received, the course proved as dangerous as had been reported in practice, and heavy rains before the race added to the likelihood of mishap. Fortunately, there was no fatal accident, though there were some serious mishaps, and one or two close calls for drivers.

Girardot, who was a likely candidate for honors, was the victim of the most serious accident. It is reported that on a down grade at Sayat, he lost control of the superb C. G. V. racer and the machine turned over and over, and was practically demolished. At the same place Farman, on a Panhard, is said to have almost been thrown over a precipice, the machine going over, but the driver and mechanician getting out in time to save themselves.

Descriptions of the winning cars, and practically all of the others competing, have been published from time to time in these pages. There were twenty-four starters, and in addition to the first three who qualified for the Gordon Bennett, two other cars that arrived as fourth and fifth were a Darracq and a Renault. This would make these cars eligible for the Vanderbilt cup race, with, of course, the three winners also.

As many had expected, the time on the course was slow. Thery is credited with completing the four rounds in 7 hours 34 minutes, and as the distance is about 340 miles, this would give a mean speed of about 45 miles an hour.

Fifteen machines were reported to have finished, a large percentage, when the course and the weather conditions are considered. Among those who were put out of the running in the race was Albert Clement in the Clement Bayard. He is such a plucky and skillful driver that his mishap caused great expression of sympathy.

The following is a list of the cars and drivers in the trials:

Automoto, 1 car entered; driver, Lapertot.

Bayard, 3 cars entered; drivers, A. Clement, Hanriot and Villemain.

C. G. V., 1 car entered; driver, Girardot.

Darracq, 3 cars entered; drivers, Hemery, Wagner and de la Touloubre.

De Dietrich, 3 cars entered; drivers, Gabriel, Rougier and Duray.

Gobron-Brillie, 1 car entered; driver, Rigolly.

Hotchkiss, 3 cars entered; drivers, A. Fournier, Le Blon and Lavergne.

Panhard, 3 cars entered; drivers, H. Farman, Heath and Teste.

Renault, 3 cars entered; drivers, Edmond, Sisz and Bernin.

Richard-Braisier, 3 cars entered; drivers. Thery, Callois and Stead.

British Team Order Reversed.

Special Correspondence.

LIVERPOOL, June 10.—Since the report of the Gordon Bennett elimination trials was sent off, the A. C. G. B. I. committee has reversed the positions of the second and third men, making the final order: 1, Earp (Napier); 2, Rolls (Wolseley); 3, Bianchi (Wolseley). As the reason for this change, the committee puts forward the number of extraordinary incident which occurred to Rolls, and so increased his running time very considerably. When going fast over a bump road, his mechanic fell back and kicked the four low tension wires from the coil. These wires were not marked, and their position had to be found by tracing back to the engine. Shortly afterwards, Rolls ran against a curb in avoiding a dog, and so strained one of his wheels that he did not risk going at full speed afterwards. These facts, combined with the faster speeds which he had made over the measured distances than Bianchi, caused his rise to second place.

The A. C. G. B. I., following its usual policy of secrecy, refuses to publish the speeds attained by the cars over the timed parts of the course, or the times for the complete circuits. Several private individuals timed the cars of their own accord

over the half-mile near Ballaugh, and these state that Macdonald's Napier made fastest speed, touching nearly eighty-five miles an hour. No other cars came near this speed, the average pace of the rest being fifty-five to sixty miles an hour.

As Macdonald's six-cylinder car would have such a decided advantage on the Auvergne circuti, where quickness in accelerating will be a *sine qua non*, the A. C. G. B. I. has been asked to allow Earp to use this car in place of his own 80-horsepower four-cylinder Napier, which is by no means so speedy. The decision is not yet known.

Great indignation has been aroused over here by the French A. C.'s action in closing the Auvergne circuit to racing cars before the English competitors had a chance to go around. The action is regarded as most unsportsmanlike, and it is probable that the A. C. G. B. I. will use its influence in endeavoring to have the prohibition removed.

Glidden Tour Preparations.

Rapid progress is being made in the preparations for the Glidden touring contest, and the work is nearly completed, though the contest does not start until July 11. Hotel accommodations for the tourists have been arranged for, and special attention has been given to that exceedingly important item to the tourist—the bath. No one appreciates more than the automobilist the pleasure of refreshment that is to be derived from a good "soaking" after a day's run through the dust or over muddy roads, and pains are being taken to make ample provision for the wants of all the contestants in this respect. Garage accommodation will, in the majority of cases, be free, though charge will, of course, be made for supplies and for cleaning or other work done. At Bretton Woods, in the White Mountains, where a stop of four days will be made, storage of cars will be free to the tourists.

Confetti will be used only occasionally, as the road will for the most part be plainly marked with signboards, which many of the automobile dealers in towns along the route are erecting at their own expense, reaping their reward in the knowledge that they are doing a good deed—and in the business card which will have a place on the board. In a few places where the roads are not easily followed, and where it has not been found practicable to have sign boards put up, confetti will be used.

More than the fifteen entries required to make the contest have been received. Among those who have expressed their intention of taking part in the tour are:

Elliott C. Lee, W. C. Temple, Lewis R. Speare, Harlan W. Whipple, George E. McQuesten (representing the A. C. G. B. I.); Augustus Post, James L. Breeze, R. P. Scott, Carl Page, George O. Draper, W. C. Hurlburt, Harold F. Pope, Charles E. Walker, Albert L. Pope, R. L. Lippitt, George H. Lowe, Windsor T. White, Walter White, Charles J. Edwards, A. R. Pardington, O. B. Cole, Percy Pierce, Robert Lee Morrell, J. M. Walters, F. W. Richards, Major C. J.S. Miller, George F. Chamberlain, F. B. Stevenson, H. W. Smith, George L. Weiss, John Caswell, Julius Mehlig. Mr. Glidden himself will accompany the tourists, though not as a competitor.

An office has been opened at 29 West Forty-second street, N. Y., in charge of A. B. Tucker, where entries for the tour will be received until the books are closed on June 27.

C. J. GLIDDEN RETURNS HOME.

The round-the-world automobile tour of C. J. Glidden has been completed, and Mr. Glidden has returned to America from Europe this week, after having driven thousands of miles in his Napier car with Mrs. Glidden in New Zealand, Australia and other countries on the opposite side of the globe. It was on this trip that the Gliddens reached the most southerly point ever touched by automobile, at Bluff, New Zealand. A quick trip was made from India to Europe, the car being left in India, where touring will be resumed later.

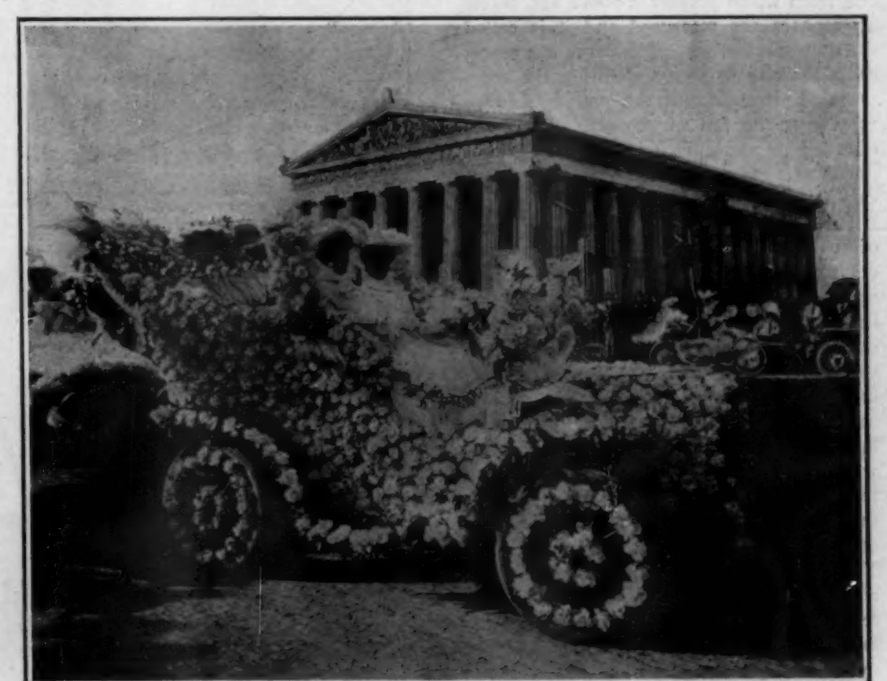
Mr. Glidden will take an active part in the July tour for the Glidden touring trophy, accompanying the contestants, but not as a competitor.

Kerosene will often keep the motor running if it is used while the motor is hot.

Autos in Peru.

A stock company, the members of which are prominent business men, has been formed in Lima, Peru, and has imported from the United States six large electric passenger automobiles having a capacity of thirty persons each, writes United States Consul Gottschalk, from Lima. The city of Lima has for some years past had a fairly complete line of horse-drawn street cars, which are well patronized; but much objection is made to the fact that only one class of accommodation is provided. Only the better classes of passengers will be provided for by the new automobiles busses, the fare being slightly higher than on the horse cars. The electric vehicles will cover a number of routes over roads that are all asphalted; and as the asphalt paving is extended, the vehicles will increase their radius and new ones will be put on as the traffic demands them. It is expected that the company operating the horse cars will electrify its road and provide both first-class and second-class accommodation to compete with the new enterprise. Proposals for supplies for the automobile line should be made to Senor Miguel Gallo Diez; and for the street car line to Senor Joaquin Godoy, both at Lima, Peru.

The latest thing in competitions is an automobile goggle competition, to ascertain the best form of eye-protectors. The contest is being organized by the French automobile club.



Of the many beautifully decorated cars in the floral parade held in Nashville recently as a feature of the Spring Festival, the one shown in the engraving above was adjudged the handsomest and was awarded first prize of $100. The car was a Rambler and was driven by Mrs. J. Cleve Symmes. The vehicle was elaborately decorated with Marie Van Houte roses and was drawn, in fancy, by huge butterflies hand painted on silk moire. Second prize was given to Mrs. Joseph Warner, who drove a White car almost completely covered with white and nile-green snowballs. Miss Shirley Cummins was given third prize for the expression of her artistic taste in pale blue and pink morning glories.

Effect of the Time of Ignition on the Performance of a Gasoline Engine.

By HAROLD H. BROWN.

IF the ignition of a charge in a gasoline engine were absolutely instantaneous or the piston could be made to pause on the center during the combustion of the charge then the best point at which to ignite the mixture would be on the center. As we can realize neither of these conditions in practice, it becomes necessary even on comparatively slow speed engines to ignite the charge before the center is reached. The most advantageous point for this ignition to occur will depend on the time required for the combustion of the charge and also on the number of revolutions per minute at which the motor happens to be running at any particular time.

Let us assume, for the purpose of illustration, that the time required for the combustion of the charge will in all cases be uniform, regardless of other conditions. Also let us assume that this time is one one-hundredth of a second.

At Fig. 1 we have an indicator diagram in which we have assumed that the piston stands still during the combustion of the charge which would give us the largest possible diagram with a given charge and compression.

In this diagram the line *a b* represents the length of the piston travel; it is also the line from which pressures above and below atmosphere are measured and it is called the atmospheric line. The curve *a c* represents the rise in pressure during the compression stroke and the curve *d r a* represents the fall of pressure during the outward or working stroke. The ignition line in this case would be the straight vertical line *c d*.

Perhaps here a word as to the nature of the combustion or explosion of the charge might be desirable. Gasoline vapor is made up entirely of hydrogen and carbon chemically combined in certain proportions. When combustion takes place the hydrogen and carbon separate and combine with the oxygen of the air to form water vapor and carbonic acid gas respectively. This combustion generates a large quantity of heat, which has the effect of greatly raising the temperature of the charge. (This temperature is variously estimated, but is generally conceded to be about 2,800 degrees Fahr.) This rise in the temperature causes a great rise in the pressure of the charge, and it is to this high temperature alone that the rise in pressure is due, for it has been found that if the products of the combustion be not allowed to expand, but are cooled to the same temperature that they were at before the combustion, that the tension or pressure will be nearly the same as before the combustion.

It has been ascertained by experiment with a good mixture that the rise in pressure due to the rise in temperature is approximately four times the compression pressure above atmosphere, and the point *d* of the expansion curve is derived in this manner. The sudden fall in pressure at the point *r* is due to the opening of the exhaust valve at this point.

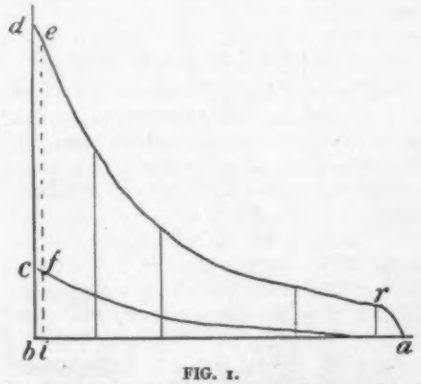


FIG. 1.
Speed 120 R. P. M. Combustion occupies from *b* to *i* of piston travel. Time 1-1,000 sec. When ignition occurs at *i* area *c d f* is lost through early ignition; when ignition occurs at *b* area *d c e* is lost through late ignition.

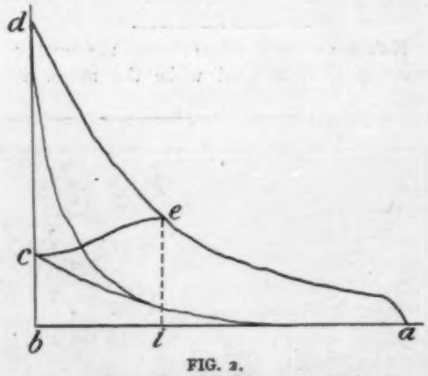


FIG. 2.
Speed 1,000 R. P. M. Combustion occupies from *b* to *i* of piston travel. Time 1-100 sec. When ignition occurs at *i* area *i c d* is lost through early ignition. When ignition occurs at *b* area *c d e* is lost through late ignition.

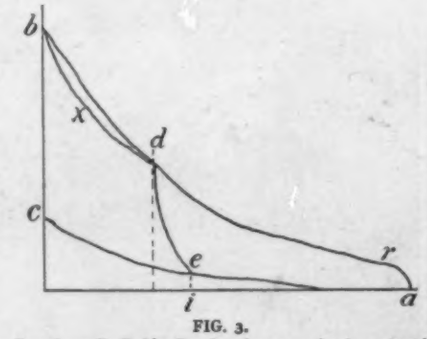


FIG. 3.
Speed 120 R. P. M. Combustion occupies from *i* to *d* when it occurs at *i*. In this the area *b c d e* is lost through too early ignition.

The heavy lines in the diagram, Fig. 1, represent the diagram which would be made if the ignition occurred with the piston standing still on the center during ignition. If we assume that the ignition of the charge takes 1-100 of a second and that the motor has a speed of 120 r. p. m. and that the charge be ignited on the center, then the piston will have moved from *b* to *i* during the completion of the ignition and we shall have lost an area (*d c e*) owing to late ignition. (We will assume during this discussion that the pressure at the completion of the combustion does not rise above the curve *d r a* at whatever point the combustion is completed, and this assumption will not be greatly in error as experiment has proved.) If, however, we ignite the charge at the point *i*, so that the ignition will be completed at the center, then we will have the full expansion curve *d r a*, but we shall lose the area *c d f* owing to this early ignition. It is therefore in practice a choice of two evils, either losing area of the diagram owing to late ignition, that is lowering the mean pressure during the expansion, or of losing area due to early ignition by increasing our mean pressure during the compression stroke. That is, we lose either the area *d c e* or *c d f*. In this case they appear nearly equal. However, let us take the case represented by Fig. 2. Here we have the diagram from a motor which is supposed to have a speed of 1,000 r. p. m. In order that the ignition may be completed before the piston reaches the center, the ignition must occur at the point *i*, which at this speed is well toward the center of the stroke. In this case we will lose through early ignition the area *i c d*, which is much larger than in the same case in Fig. 1. However, let us suppose that the ignition does not occur till the motor is on the center; then the combustion will not be completed till the piston has reached the position *i*, and we shall have the combustion line *c e*. We shall therefore lose through late ignition the area *c d e*. It will, however, be seen from an inspection of this diagram that the loss of area through early ignition is much less than that due to late ignition at this speed, although in both cases it is considerable.

Fig. 3 is given to show the evils of too early ignition. In this case the motor is supposed to be turning over at a speed of 120 r. p. m., while the ignition occurs at a point which would be about right for a speed of 1,000 r. p. m. The combustion will be then completed at the point *d*, and the combustion line will be *e d*. The probability is that at this slow speed the pressure due to the ignition of the charge at this point will be great enough to stop the movement of the piston toward the head of the cylinder and cause it to move outward again, making what is known as a "back kick," and the diagram will be *a e d r*. If, however, we have energy enough stored in the flywheel to overcome the pressure, the line will probably closely follow the line *d b* and will on the outward stroke nearly retrace this line. However, it will probably fall slightly below it, making the line *b x d*, thus forming a

negative area, and this will then have to be subtracted from the area *a e d r*.

By a little reflection after an inspection of these diagrams it will be seen that with the spark set to occur comparatively late the maximum pressure during the working stroke tends to grow less and less, and hence the area of the diagram to grow smaller and smaller as the speed increases. This diminution will continue, as the speed increases, until the indicated power of the engine is just equal to the resistance of its moving parts and the external load when the speed will become constant. If now we advance the spark we will increase the area of the diagram as a whole, the power output of the engine will be increased and the engine will tend to increase its speed. On the other hand, if the spark be advanced too far, the work done during the compression stroke by the energy stored in the flywheel will be greatly increased without increasing the work done during the working stroke, and hence there will be a loss of power owing to too great an advance of the spark, the amount depending on the amount of excess advance.

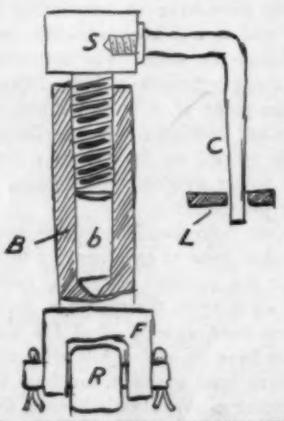
It will readily be seen that it is therefore possible to vary the speed and power output of a motor anywhere within its limits, with a wide open throttle, by varying the time of the ignition. This method of control, however, has the disadvantages that it is very wasteful of fuel and it has a tendency to overheat the motor.

Controlling the speed by means of the spark advance has its advantages, however, especially at very low speeds, for if we then try to regulate by means of the throttle entirely we shall find (especially with an automatic inlet valve) that we are in great danger of stalling the motor. Judicious use of both the throttle and spark advance, in combination or singly, according to circumstances which may arise in practice is one very good sign of a competent driver.

From the above discussion we may learn the following practical points on the operation of a car: First, that as the speed increases the spark should be advanced gradually. Second, that this advance should be kept up as long as the motor speed increases. Third, that as soon as the motor speed tends to decrease the spark should be *gradually* retarded until the speed ceases to decrease.

Variable Valve Lift.

In the Germain cars, made by a Belgian concern, the cylinders are turned out of cast iron or steel as desired by the purchaser and the water jacket is of spun copper sprung between two gores, one in the cylinder head and the other at the middle of the cylinder. The most peculiar feature of the Germain cars, however, is the mechanism for varying the lift of the inlet valves.



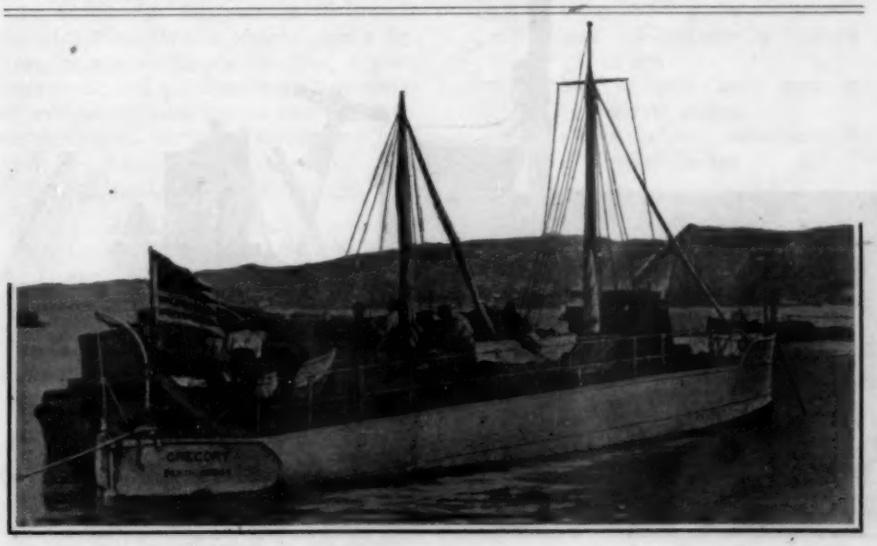
SKETCH ILLUSTRATING VARIABLE VALVE LIFT ON GERMAIN CAR.

The valves are mechanically operated and are located directly over the camshaft. The valve lifter block is as usual of square section and fits in a squarebored bronze guide screwed into the crankcase. At the lower end of the lifter block is a roller that rides over the cam. The lifter block itself is bored longitudinally and in this bore is tapped a square screw thread, into which fits a vertical screw with a large round head. The head of this screw acts upon the valve stem to lift it when the lifter block is raised by the cam.

The amount of lift is determined by turning this screw down or up. If, while the engine is running, the length of screw protruding out of the lifter block is varied by suitable means, the distance through which the valve will be lifted will be increased or decreased, as desired, and the period of its movement lengthened or shortened, provided the profile of the cam is constant.

The means by which this is accomplished is as follows:

Referring to the drawing, *R* is the roller riding over the cam and it is held in a fork *F*, forged in one piece with the lifter block *B*. This is bored as shown at *b* and fitted with the screw *S*, having a massive head. A finger or catch *C*, of steel rod bent and tempered, is screwed home in the head as shown. The downwardly projecting end of this finger is of such a length that it never leaves a hole drilled in the end of a flat steel bar *L*, no matter how high the whole system may be lifted within working limits. The bar *L* is laid horizontally alongside the engine and slides longitudinally in guides. This rod, which connects the catches of all the inlet valve lifters of the four-cylinder engine, is actuated from a lever on the steering wheel. Its action can be compared to that of the rod connecting the different drivers on one side of a locomotive.



From La Vie au Grand Air.

GASOLINE POWER BOAT "GREGORY" TAKING ON 2,000 LITERS OF GASOLINE AT ALGIERS AFTER HER TRANSATLANTIC VOYAGE FROM NEW YORK.

PRIZES FOR GOOD ROADS.

St. Paul Tourists to Vote on Counties Having the Best Roads.

Special Correspondence.

ST. PAUL, June 17.—The St. Paul Automobile Club has adopted a unique plan to encourage the construction of good roads. It has decided to offer $1,000 in prizes to be distributed among the three counties furnishing the best roads for the Chicago-St. Paul run ending at St. Paul on July 4.

The counties in northern Illinois, northwestern Iowa and southern Minnesota, through which the automobilists will pass, will be eligible to compete for the prizes, and those who take part in the tour will be the judges. The tourists will ballot on the question of good roads Saturday, July 8. Each automobilist will have one vote and will cast it for a single county.

The county receiving the largest number of votes will receive a cash prize of $500. The county getting the second largest number will receive $300, and the third prize will be $200.

The Automobile Club of China, with headquarters at Shanghai, is said to be the very latest organization of its kind. Doesn't sound right, somehow; gives an idea of fragility. Now, when it comes to automobile laws of China, the fragility won't seem so much out of place.

Olds 2,000 Pound Winged Express Wagon.

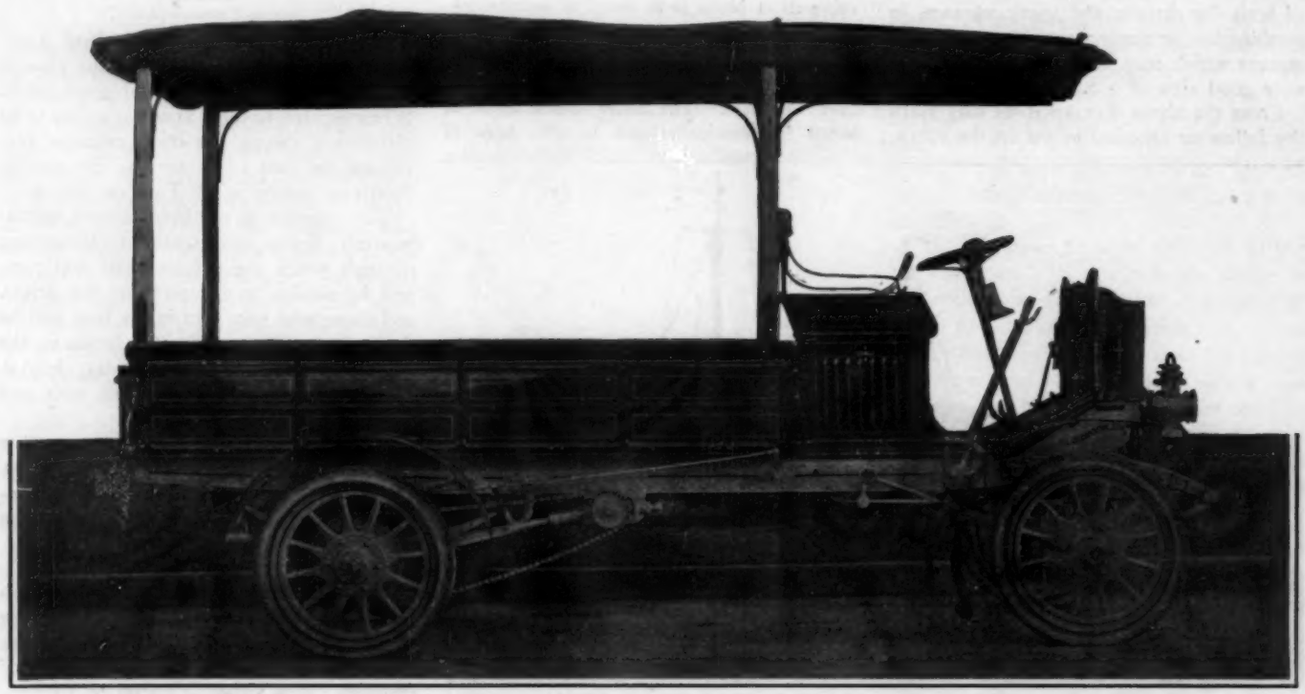
MANUFACTURERS have found a wide field for their endeavors in the building of pleasure automobiles, and this field is increasing as the automobile becomes better known, as it increases in reliability and certainty of operation, and as the public becomes educated to the proper point. Pleasure automobiling, however, is but a small matter compared with the vast field that opens to the manufacturer who looks ahead and does a little thinking about the possibilities of the automobile in the commercial world. The enormous advantages possessed by motor-propelled vehicles for carrying burdens of all kinds cannot be kept out of sight by want of mechanical perfection—a want which is steadily disappearing along with public prejudice against the "emancipator of the horse." The commercial automobile occupies half the room of a horse-drawn outfit, and does two or three times the work; it is more cleanly and quieter than the old-fashioned methods, though most persons have not as yet become so accustomed to the new sounds as to appreciate the fact that they are less in volume than the clattering of hoofs and the rattle and bang of steel tires; it cannot be overcome by the summer heat or slip and fall to death on the icy pavements of winter; and so the category might be continued indefinitely. The uses to which the well-built commercial machine can be put are, of course, legion, covering, in fact, the entire range of work done by horse-drawn vehicles and encroaching not a little upon the field of the electric and steam railroads.

The manufacturer whose machine is illustrated and described in this article is arranging to build a car for a mining prospector. The frequenter of unfrequented places has experienced great difficulty because he operates in a region where horse-feed is scarce, and the three or four horses he uses to haul his outfit expend most of their strength in transporting supplies for their own consumption. After journeying sixty or seventy miles, the prospector will make a stop of several days, during which the horses usually manage to consume all the feed they have so laboriously brought along, and a trip back again is necessary to replenish the stock. The automobile will make the proposition a very different one from the point of view of the supply question, to say nothing of the possibilities that may be opened up by having a source of motive power available for helping out the mining prospector.

Another correspondent of the same concern makes trips of two hundred miles each way for the purpose of buying cattle. He travels away from the railroads, and horses have not been exactly ideal for his work. He is to have an automobile with tanks big enough to hold gasoline for four hundred miles running. Wholesale houses, the manufacturer states, are adopting automobiles for the use of their salesmen in rural territory. It would be a really difficult task to find any important branch of commercial work in which the automobile has not figured in some degree, though not perhaps prominently as yet.

The machine illustrated is one of several styles built by the Olds Motor Works, of Detroit, Mich., and is called a winged express wagon. With a tare of 2,800 pounds, it has a carrying capacity of about a ton; the motor is of the double opposed cylinder type, located under the body in a horizontal position; has cylinders of 5-inch bore and 5-inch stroke, and is rated at 16-horsepower at 750 revolutions a minute. The pistons are long—six and a half inches—insuring long service with a minimum of wear; and the idea of providing ample bearing surface is carried out in other moving parts, notably in the crankshaft, which has three babbitted bearings aggregating more than 10 inches in length, all 1 7-8 inches in diameter. Crank pins are of the same diameter as the main shaft bearings, and have a length of 2 5-8 inches. The connecting rod is made from a steel drop forging, and is 12 inches long between centres; the crank pin end is babbitted and the piston pin end is bushed with bronze; means for adjustment are provided at both ends.

Lubrication of the shaft bearings and crank pins is provided for by splashing the oil contained in the crank case, suitable ducts being made for carrying the oil to the bearing surfaces. The cylinders are oiled by forced feed from a mechanical lubricator. All valves are mechanically operated and all are of the same diameter, 1 7-8 inches, lifting 3-8 inch. Instead of being made of a single piece, the valve has a stem made of a tool steel rod screwed into the valve head and riveted securely in place; the stem is 3-8 inch in diameter. The circulating water is cooled by a coil radiator placed in front of the dashboard, circula-



OLDS 2,000 POUND WINGED EXPRESS WAGON FITTED WITH DOUBLE OPPOSED HORIZONTAL MOTOR OF 16 HORSEPOWER.

tion being maintained by a gear pump driven by spur gearing from the crankshaft. Ten gallons of water is carried in a tank connected with the circulating system.

Drive is from motor to a countershaft by a 2-inch silent chain, and from the countershaft to the rear wheels by side chains, the rear axle being "dead." This construction makes it possible to use a very strong rear axle, an I-beam section of heavy steel being employed. The front axle is of the same stock. Transmission gear is planetary, using steel and bronze gears encased and running in oil; two forward speeds and reverse are provided for, the reverse being obtained by the use of a pedal and the forward speeds by a lever on the right-hand side of the driver.

Pressed steel longitudinal frame members are tied together by five cross members of the same material. All springs are semi-elliptic; each pair of springs is connected at the rear ends to a cross spring. Wheels are of the artillery type, of heavy construction, and have twelve spokes each; they are fitted with 4-inch solid rubber tires 30 inches in diameter. Ball bearings are used in all wheel hubs; a ring of ten balls, each 1 inch in diameter, takes the main strain, being directly in the centre; while a circle of eleven ⅝-inch balls is placed near the outer end of the hub. The countershaft runs on roller bearings.

In order that the driver may not be placed in danger by forgetting to retard the ignition when starting the motor, there is a safety lever which must be depressed before the crank can be applied, the lever retarding the spark as it descends, and also automatically relieving the compression. A brake on the differential is controlled by a pedal, while the emergency brakes on the hubs are operated by a hand-lever and are of the internal expanding type, with automatic compensating gear; the operating lever is fitted with a retaining ratchet. The gasoline tank has capacity for eleven gallons. The wheelbase of the car is 100 inches.

In addition to the machine illustrated, the Olds Motor Works manufactures a delivery wagon of the express type, a platform truck, and a ten-passenger wagonette, all built on the same general lines so far as the mechanical features are concerned.

TOLL ROAD OUT OF 'FRISCO.

Special Correspondence.

SAN FRANCISCO, June 14.—Practically all the necessary rights of way have been obtained for the toll-road which is to be built by private subscription from San Francisco into San Mateo County. The preliminary surveys have been obtained, and work will be started in the near future.

The project has been started by President Schwerin and others of the Automobile Club of California because there is not a suitable highway, at present, leading out of San Francisco. As the city is on a peninsula, the only outlet, except by the various ferries, is by the somewhat narrow neck of land leading into San Mateo County.

Letter Box

Valve Areas and Lift.

[215].—We are building a 10-horsepower four-cycle automobile engine, and as we have no drawings we are unable to proceed further. The engine is double-cylinder vertical with four-inch bore and five-inch stroke. We take the liberty of asking you the following questions:

What should be the size of the inlet valve port, and of the exhaust valve port? How much should the exhaust valve lift?

R. A.

Bellaire, O.

Building a gasoline engine by rule of thumb, designing each part after some of the others have been made, is a very poor method of turning out such a comparatively delicate machine as an automobile engine. The whole engine should be laid down on paper before even the pattern work is started, or you are sure to have difficulties that may make your previous work go for nothing; and at best the engine will be a sort of a patchwork affair. There are innumerable gasoline motors rusting away in dark corners of machine shops all over the country, and no one ever hears of them because they were built in this way, and were dismal failures. On the other hand, a good mechanical man should have no great difficulty in designing a fair gasoline motor, if he will take the trouble to study the subject, using some of the many books that are available; and with first-class workmanship a reasonable degree of success should be practically assured.

Replying directly to your questions, the valve dimensions depend largely upon the calculated speed of your engine. The following rule will give good results, and is applicable to high-speed motors:

Let S = piston speed in feet per minute.
A = area of cylinder in square inches.
I = area of inlet valve port in square inches.
E = area of exhaust valve port in square inches.

Then $I = \frac{AS}{6{,}000}$ and $E = \frac{AS}{5{,}000}$.

The lift of the exhaust valve should be one-fourth the diameter of the port..

Correction of Back Firing.

Editor THE AUTOMOBILE:

[216].—I have a 1905 four-cylinder machine which at times acts very strangely. When speeding the engine to approximately its limit there is a firing back in the vaporizer. Can you tell me the cause of this and say how it can be prevented? J. L. S.

Boston, Mass.

The trouble is that ignition occurs before the closing of one or more of the inlet valves, probably because the valve returns to its seat too sluggishly when the engine is running fast, so that the flame of the burning charge is communicated to the mixture in the supply pipe. If the valves are of the automatic type, you should increase the tension of the springs of the valve at fault; if they are mechanically operated, make sure that they are not held open too long by the cams before adjusting the springs. As the trouble occurs only at high speeds, however, probably one or more of the springs will be found a little weak.

Clogged Carbureter or Feed Pipe.

Editor THE AUTOMOBILE:

[217].—I would like to ask some questions about the strange behavior of my automobile engine. I can start it with a turn of the crank and it will run all right for about fifteen seconds, and then slows down and stops. After the motor stops I can hardly get it to start again, sometimes cranking for ten or fifteen minutes. The carbureter is correctly connected up and I have examined the electrical system and it is all right, giving a good hot spark at the plug, but the engine will not run enough to do any good. I have adjusted the carbureter until I think I have almost worn the threads off the screws. What is the trouble? Is it in the engine, or the carbureter, or what? I cannot use my machine at all and would be glad if you could help me out.

W. H. H.

Washington C. H., O.

There is evidently a stoppage somewhere in the gasoline feed piping so that the gasoline cannot get to the carbureter as fast as the engine uses it. After standing for some time sufficient gasoline runs into the carbureter to start the motor, but is soon used up and the motor refuses to start until more fuel is available. Clean out the carbureter thoroughly and go over the piping from the tank to the carbureter, and you will doubtless find the cause of the trouble.

Wants Low Power Four-Cylinder Engine.

Editor THE AUTOMOBILE:

[218].—Can you tell me where I can buy a four-cylinder gasoline engine with about three inches bore and stroke? Does anyone make a three or four-cylinder engine developing about 6 or 7 horsepower? I have never seen a small engine with three or four cylinders except those made for motorcycles. M.

Peoria, Ill.

We do not know of any manufacturer turning out motors such as you mention for use in automobiles. For motors of small power the combinations of two cylinders—double opposed and vertical twin cylinder—are so satisfactory that nothing would be gained by adding more cylinders and more complications.

THE AUTOMOBILE

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" " Since Jan. 1, -	**349,500**

Fashionable to Abuse the Chauffeur.

"Does it ever happen that the chauffeur is in the right?" This very pertinent query was put to a New York police magistrate by Mme. LILLIAN NORDICA, the famous prima donna, during a hearing in court a few days ago. The charge was speeding, sworn to by a police officer, who testified that he had followed and timed the car in which the famous singer and her sister were being driven by her chauffeur. The latter was the alleged culprit, and not even the testimony of Mme. NORDICA, that the car was driven slowly, could save the chauffeur from being held to Special Sessions.

Mme. NORDICA's comment was in refreshing contrast to the utterance of many of the sterner sex, who on every opportunity, public and private, abuse the unfortunate chauffeur. Indeed, it has become the fashion with many to lay all the blame for unfavorable judicial and public opinion concerning automobiles on the chauffeur.

While it is quite true that there are chauffeurs who are dissipated, reckless and wholly irresponsible, it is equally true that many are possessed of self-respect, a high order of intelligence and are in every way as worthy of public esteem as the men who handle locomotives on the railroads, for example. There would be few bad chauffeurs were their employers to exercise the same control and supervision over their conduct as they do over any other kind of help. Any reputable garage will record the coming and going of a car, so that it cannot be used surreptitiously for long without the employer knowing it, and when they are out together the employer has an excellent chance to size up his driver. "Like master, like man," is an old proverb that is not without direct application.

It is certainly notable that several fatal and indeed horrible accidents which have occurred lately have involved the owner just as much as the driver; in fact, in more than one case the owner was driving himself. Again, during a recent, well-organized and well-managed, club economy trial on Long Island three of the participants and owners deliberately broke the speed laws, and one was arrested and properly fined. The other two did not turn in any record of their performances—a lawless dash suited their purpose better than the patient accumulation of any economic data.

The behavior of many chauffeurs during the storm which overtook the orphans on their return home from the recent New York Motor Club's outing showed a creditable fineness of feeling. Stopping at roadside hotels, they purchased hot coffee for the little ones, warmed them up and sent them home in comfort on trolley cars, paying all the expenses out of their own pockets and later refusing any return of the money so expended.

Professional automobile driving is a new calling, and the good and bad have not been very well separated as yet, but it is a mistake to suppose that all belong either to the one sort or the other.

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Motor Fuel of the Future.

One of the problems connected with the future of the automobile, and a problem that must be solved in some way before many years, is the question of fuel.—a matter which is receiving a good deal more attention abroad than at home. The rapidly increasing number of pleasure automobiles in use is very suggestive, but the commercial field, once well cultivated, will yield a harvest whose magnitude can be but dimly imagined. Once the commercial motor vehicle attains a general practibility and its merits are appreciated, its use in great numbers is bound to be only a question of a little time. At the present time the use of gasoline as fuel for explosion motors has brought the price of that fluid from almost nothing as a waste product to a comparatively high and ever increasing figure. It is not difficult to believe that in a very few years there will be ten motor-propelled vehicles in use for every one now running; and it also seeems probable that the majority, or at least a very large proportion of the machines will be commercial vehicles—trucks, delivery wagons and the like. The consumption of fuel will, of course, be enormously increased, not only because there will be more motors using it, but because the machines will be of the kind that work long hours nearly every day, and not occasionally in fine weather, as is the case with pleasure cars.

The question is, how will the demand for fuel be met? It does not seem possible that gasoline can be produced in anything like sufficient quantities, and its successor has not yet asserted itself. Kerosene seems to be in many respects a strong candidate for the place, but has many defects—low vapor tension and consequent difficulty of carburation; lack of homogenity, which results in the gradual increase of density of the oil in the tank, and so on. Nevertheless, kerosene can be used, under favorable conditions, with excellent results, so far as power production is concerned, and also very cheaply. It only remains for someone to supply the means for producing continuously "favorable circumstances." Alcohol is also difficult to gasify, but does not split up when carbureted, and the last drop will be the same density as the first. Alcohol, however, is not immediately available, while kerosene is with us in unlisted quantities. There is nothing like making the best of what is already at hand.

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Accused of Another Crime.

The latest charge against the automobile comes from New Jersey, where the farmers complain that the dust raised by passing machines drifts across the strawberry fields and settles upon the fruit, seriously affecting its market value. One of the largest berry growers in South Orange township has memorialized the township committee, asking it to take some action to stop the nuisance, and the chairman has said that the complaint was reasonable and that steps would be taken to remedy the trouble.

The question arises, what direction will the steps take? Automobiles cannot be denied the use of the roads, as the courts have decided; and the dust we have always with us—when we don't have mud. The roads cannot very well be closed until the farmers' berries are all picked, and if they could there still would be the raspberries and blackberries to protect, and after them the peaches and grapes, so we should have a closed season for roads through all the summer and most of the fall.

It seems a bit odd that no complaint is made about the clouds of dust raised by the passing of horse-drawn pleasure vehicles and farm wagons—but perhaps such vehicles are looked upon as a necessary evil, as the farmer himself must get to town with his spring vegetables and to church on the Sabbath, while the automobiles can go in some other direction and spread the dust on other peoples' berries.

For some reason the complaining farmer appears to take no interest in remedial measures that have proved successful in California and in Europe; that is, the laying of the dust by the application of crude petroleum or westrumite. Possibly the element of ex-

pense, which implies increased taxation of property, has something to do with this. It is noteworthy, however, that the class of citizens which has shown most interest in the matter, and not only proposed the adoption of such a measure, is the automobile users.

Long Island farmers have the automobilists to thank for about the only dustless roads they have—those over which the Vanderbilt Cup race was run last October.

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Successful Auto Stage Experiments A very interesting contribution to the scant literature on the practical use of commercial vehicles, by Mr. C. H. MARTIN, will be found on another page of this issue. It is of especial importance and value just at this time as showing the economic possibilities of automobile stage lines as auxiliaries to railroads—an industrial departure that is occupying many minds in all sections of the United States at the present time. There has been a growing demand for several years for a type of self-propelled vehicle that would prove reliable and economical for the transportation of passengers and baggage over fixed routes on regular schedules.

It must be obvious if such a line can be conducted for a year successfully and most profitably in Porto Rico, equally satisfactory results can be expected in this country. There the management has to contend with such adverse conditions as torrential rains at certain seasons, heat and humidity at others, a scarcity of competent men to drive and repair the cars, a great distance from the factory where the cars are built, heavy express and cable tolls, fear of the machines by the natives, and a certain amount of conservatism and oppression by the better classes of citizens and property owners. Despite all these and other difficulties, the schedule has been maintained for a year without interruption or serious accident, and the balance sheet shows a substantial profit for the owners.

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TRACK race meetings are a frequent manifestation of club activities nowadays, and whatever difference of opinion there may be about their technical value there is no doubt that they stimulate local interest in automobiling. They bring together many persons interested in outdoor life and sport, and the presence of many private automobiles of spectators is an object lesson to those who do not already own or drive.

The recent meeting at Hartford was of this order. It provided a delightful outing for several thousand persons and brought the club into a very favorable light with those who attended and many other thousands who read about the meeting in the daily press. Those who came from outside places to participate in the meeting carried away very pleasant memories of the hospitality and enthusiasm of the Hartford Automobile Club.

AFTER A COAST RECORD.

Whitman and Hamlin Start on Los Angeles-San Francisco Run.

Special Correspondence.

LOS ANGELES, June 15.—At just one minute past midnight this morning, L. L. Whitman, holder of the transcontinental automobile record, slipped his clutch and started his little Franklin runabout on an endurance run from this city to San Francisco, a distance of about 500 miles, over the average country road. The record for the run is fifty-three hours, and Whitman expects to make it in about forty-three hours with ordinary luck. The record is held by a Packard car and was made a good while ago.

Whitman took with him Ralph Hamlin, the Los Angeles agent of the Franklin. The start was auspicious, for everything had been in readiness hours before, and promptly on time the journey commenced.

Whitman and Hamlin will manage the car alternately, as suits their convenience. Most of the fast running will be done at night, so as to avoid as much as possible the heat of the day and the passing of horses. The weather all through California at this time of the year is delightful, and at no part of the journey is the road many miles inland from the Pacific ocean, from which cool breezes blow. The car, which is a regular stock model, is provided with powerful searchlights, and the men are fairly well acquainted with the roads.

Whitman selected the Calabases-Canejo pass road to Ventura. He expects to eat breakfast in Santa Barbara, after covering a distance of 110 miles. From Santa Barbara to San Luis Obispo, 117 miles, is the next stop. Then the route lies through Bradley, Jolen, King City, Salinas, San Juan, Gilroy and San Jose. A sealed box will be carried along to be used as a receptacle in which to deposit envelopes showing the time when the various stations were reached. Spedometer and odometer devices to measure the distance and speed accurately should show some interesting results.

Hamlin stated just before leaving here that if no accident happened to the machine on the trip, they might try for a new record coming back.

The car is the same one used by Whitman in crossing the continent last fall, and he carries the same good luck canteen that he had when he crossed the country in a little Oldsmobile on his first trip.

RACES FOR WESTERN TOURISTS

Attractive Prizes for St. Paul Meeting—List of Events.

Special Correspondence.

ST. PAUL, MINN., June 17.—A number of entries have been received for the race meet, which will be held here July 6 and 8, in connection with the Chicago-St. Paul automobile tour. The Hamline track is being put in condition, and every effort is being made to insure the success of the races.

The program as announced to-day contains twenty-four events, including two special exhibitions. One and two-mile dashes against the world's track record. An aggregate of $15,000 in prizes will be offered in the several events.

The list of events is as follows:

JULY 6.

Three-Mile Novelty Race.—Touring cars fully equipped, carrying driver and three passengers. Cars to line up with dead engines; at the starter's signal, engines will be started and driver and passengers will board the car; machines will be stopped, unloaded, reloaded and restarted at the end of each mile. Prize, silver cup.

Five miles, club championship, for silver and gold trophy, preliminary heat. For representatives of New York, Chicago and St. Paul clubs.

Manufacturers and Dealers.—Stripped stock cars. Prize, silver trophy.

Five miles, free-for-all, preliminary heat. Cars weighing not more than 1,432 pounds. First prize, $500; second, $300; third, $200.

Two miles, open for amateurs. Prizes, silver and gold trophies.

Match race for $500.—Two steam cars making best time will meet, and winner will race winner of match race between two gasoline machines.

Invitation race for $1,000, preliminary heat. Purse to be divided into three prizes.

Free-for-all. First prize, $1,500; second, $750, and third, $250.

JULY 8.

Two miles, flying start, against world's track record.

Two miles, novelty race for gold medal. Women with escorts will drive.

One mile for Minnesota cars.

Five mile handicap. Touring cars, owners to drive. Prize, silver trophy.

Manufacturers and Dealers.—Stripped stock cars.

Ten miles, for cars weighing not more than 1,432 pounds. Owners to drive.

Five miles, pursuit, for gold cup.

Match race for $500 between four cars making best time in previous events.

Final heats of the five-mile club championship; five-mile free-for-all; five miles for amateurs; $2,500 race, and the $1,000 invitation race.

A. A. A. racing rules will govern, and entries for the meet will be received by Secretary B. A. Ledy, of the St. Paul Automobile Club.

FLORIDA RACES ON JULY 4.

First Meeting of Jacksonville Club at Pablo-Atlantic Beach.

Special Correspondence.

JACKSONVILLE, FLA., June 16.—Arrangements have been practically completed for the automobile races which will be held on Pablo-Atlantic Beach, July 4, under the auspices of the Jacksonville Automobile and Motor Boat Club. The meet has been sanctioned by the American Automobile Association, and the racing committee of the local club has announced the following list of events:

Five miles, for cars weighing from 1,432 to 2,204 pounds. One turn; three heats.

Five miles, for cars weighing from 851 to 1,432 pounds. One turn; three heats.

Two miles, for cars weighing from 551 to 851 pounds. One turn; three heats.

Two miles, straightaway, for Ramblers and Cadillacs. Flying start; three heats.

One mile time trial for Pablo-Atlantic Beach record. Free-for-all. Flying start; three heats.

Five-mile motorcycle race.

Five-Mile Consolation.—For non-winners in previous events.

All of the races will be started between Pablo Beach and Atlantic Beach, and will be run northward. The races with a turn will be finished just north of the pavilion at Pablo Beach.

Entries close with Fred E. Gilbert, 41 West Forsyth Street, Jacksonville, at 12 o'clock, midnight, July 3.

When cranking your motor, don't turn it over lazily, but give it a sharp, quick throw.

TROUBLE FOLLOWS ACCIDENT.

Kansas City Police Grow Active—Much Confusion Over Laws.

Special Correspondence.

KANSAS CITY, Mo., June 17.—The running down of Willie Dawson, a boy, on May 28, by an automobile here has started the first agitation against motorists that Kansas City has ever experienced and the motorphobe, at present, is in control of the situation.

Following the accident, Victor Snyder, chauffeur for the Belmont Auto and Cycle Company, was tried in court, but no case was made. Then began a systematic campaign of arrests for speeding, only one of which has thus far resulted in a conviction.

F. E. Gloyd, a member of the Automobile Club of Kansas City, against the advice of the other members of the club, paid the fine of $10 which had been imposed on him on the charge of running at a speed of twenty-five miles an hour in town. No good case was made against Gloyd, but the fine was imposed and he paid.

Fred Patee, the Cadillac agent, also was arrested, but the patrolman who brought him into court could not prove that he was the driver of the car, which was claimed to be without a license tag.

W. C. Evans, of Philadelphia, representing the Autocar Company, was one of the victims yesterday. He was driving a four-cylinder Autocar from the garage of E. P. Moriarty & Company. The car had no number. Mr. Evans will fight the case.

In the matter of taxing the autoist twice, the city and county authorities have reached an agreement. The city license numbers, to correspond with the vehicle tax, run from 1,000 upwards. The county numbers, representing the state tax, range from one upwards. Each operator is thus compelled to carry two numbers in order to comply with the law. The carrying of a tag for the vehicle tax never was contemplated by the ordinance, which requires that the number shall correspond with the number of the operator's license, which is to be secured after an examination. Only about twenty autoists have been examined before this board, whose proceedings are a farce and one of whose members knows nothing at all about automobiles. Another member of the board carries no number of any kind on his car; being on the board makes him exempt, apparently.

If the authorities become still more confused about the law than they now are, owners may be compelled to carry three numbers and the back of a car will look like an arithmetic.

Mr. Gloyd is the only member of the Automobile Club to be arrested. The club sent out a letter yesterday informing members that it intended to test all the local regulations regarding automobiles. The legality of a vehicle tax will be attacked; the operator's license clause in the latest ordinance will be taken into court, and an effort will be made to have the park board allow automobiles on drives from which cars have been excluded. The club hopes, by this action, to secure favorable terms and incidentally to secure most of the local automobilists as members. There are 60 members now out of 350 owners in the city.

The arrest of Mr. Evans was wholly contrary to the law, which specifically exempts dealers from the provisions of the vehicle tax ordinance.

As usual, a few reckless chauffeurs are to blame for the trouble the careful drivers are now having.

Trade has been only slightly affected so far, although dealers look for a falling off in sales if the agitation continues.

Here are the taxes a Kansas City automobilist is supposed to pay without grumbling:

Personal assessment on his car:

To the state (county), $2; vehicle tax to the city, $5; operator's license, $1; cost for tags (about) $1.

The case of Fred Patee, which is now pending in the Supreme Court, bears directly on the new city ordinance, every section of which Patee violated in order to get the case squarely before the courts.

AN OKLAHOMA HOLD-UP.

Money Safely Transferred From 101 Ranch in Dr. Thomas' Steamer.

Special Correspondence.

BLISS, OKLA., June 15.—A thrilling incident in connection with the big buffalo hunt on the 101 Ranch, held June 11, has demonstrated a new and unforeseen use of the automobile. Large amounts of money had been taken in during the day at the small, temporary building which served as an office. By evening the amount aggregated $40,000. As the cashiers were counting the money the crowd gathered around, watching the performance. Among the spectators were several men dressed as cowboys, who had not taken part in the parade, but had kept their horses fresh during the day. Mr. Miller's original plan had been to leave the money on the grounds during the night, but the danger of this occurred to him, and he concluded to take the money to Ponca City, the nearest banking town.

Dr. H. E. Thomas, of Chicago, a guest of the ranch, gladly consented to the use of his automobile, and when the last excursion train had pulled out, some time after midnight, the bags of money were quietly loaded into the machine, which steamed away, Mr. McGowan operating it, and accompanied by Dr. Thomas, W. G. Maurice, of Hot Springs, and George L. Miller.

At Cowskin Creek, where the road dips down to a small bridge and scraggly trees shade the approach on each side, a band of horsemen rushed from the shadows on both sides of the crossing and fired a volley of bullets. A bullet took off Dr. Thomas's cap. Mc.Gowan opened the speed throttle and the car shot out of the shadows and up the bank, pursued by the horsemen, who were quickly distanced. When it was safe to slow down it was found that no one was injured, but the knob had been shot off the speed regulator and McGowan felt his call had been close.

GORDON BENNETT TIRE DEPOTS.

Tires on the American cars that are to compete in the Gordon Bennett race in France next month are to be taken care of by a corps of five experts from the Diamond Tire Company's factory, directed by C. B. Myers, who sailed a few days ago from New York with full sets of supplies and tools. All three of the American cars are fitted with Diamond wrapped-thread tires. No less than six tire controls will be established by the Diamond people, at which experts will be stationed to give every aid in the way of quick attention to possible tire trouble to each of the American representatives in the contest.

An English inventor has made an apparatus by which automobiles may be timed and both automobile and time-piece photographed at the same instant, the exact time and the position of the automobile being shown on the same plate.

'FRISCO MAY EXPERIMENT.

Having Acquired a Street Railway, the City May Adopt Gasoline Cars.

Special Correspondence.

SAN FRANCISCO, June 14.—This city has just taken the initial steps toward municipal ownership of its street railways, having fallen heir by expiration of its franchise to the Geary Street Railway, and a suggestion has been made that the road be equipped with gasoline motor cars, making it in effect an automobile line.

When the Geary street franchise expired, some months ago, it was proposed, and the proposition has been practically agreed to by the board of supervisors, that the city should run the road itself. The road is only a very small part of the city's system, and has been allowed to run down, both in equipment and in roadbed. It runs through an attractive section of the city, however, and has one terminus in the heart of the business section and the other at Golden Gate Park. The suggestion for an automobile line comes from the Central Labor body, which holds that such a service would solve the problem of comfortable and rapid transit without unsightly poles. The road is at present operated by a cable. If an attempt is made to introduce an overhead trolley, there will undoubtedly be a strong protest, while a change from the present system is desirable. The finance committee has recommended an appropriation of $350,000 in the annual budget for the reconstruction of the road and its conversion into an electric road with an underground conduit system. This appropriation undoubtedly will pass, but the board is by no means committed to any particular system. The underground conduit system has just been rejected by the main street railway corporation of the city in the reconstruction of the Sutter street line, which parallels the Geary street line for a considerable distance. The temper of the board is in favor of a first-class system, and it is not likely to reject innovations merely because they are innovations.

NEW PUBLICATIONS.

It is curious that sea stories are often written by landsmen, and without doubt automobile stories are often written by pedestrians. F. U. Adams, the writer of the new novel, "John Henry Smith," is either that or a golf player, which is about the same thing. He has made an automobile do a lot of stunts in the story that make good reading of the country club flirtation kind, in which repair bills are manifestly too prosaic to be considered. Still, if Mr. Adams would give some manufacturer the tip how a heavy touring car can be sent smash through a board fence without putting the radiator out of commission, he will be able to add a good many dollars to his royalties on the book, and they should be large, for it is a good summer story. The hero, J. H. Smith, is one of those big, well-to-do fellows who cultivate golf and composure, and who are always Johnny-on-the-spot when the heroic act is to be done in sight of their sweethearts. There is a lot of golf, a heap of love-making, and plenty of automobiling in the story, which is supposed to be a revised edition of the personal diary of Mr. Smith. He was a bit of an artist, too, and his crude sketches are displayed after the pen of A. B. Frost had inked them in. The scene is laid in the vicinity of New York, and sometimes in sight of the Hudson, and there is a happy sequel at the Scotch links of St. Andrews. The book is a good vacation investment of $1.50. For

some unexplained reason the cover is ornamented with a highly colored print of a "bounder," with the name of the author below and the hero above, so that you are left to your choice. It is a libel on the contents. Doubleday, Page & Co., of New York, are the publishers.

Four good short stories which are written around the automobile, by Lloyd Osbourne, are issued as one of the pocket book series by The Bobbs-Merrill Co., of Indianapolis, which is a likely place for a book of the sort to come from, as it is the home of several good cars. The episode of the girl and the Englishman who did not like to soil his hands with motor grease, the outcome of a syndicate ownership of a car, the adventures of a young lady of fashion who drove an auto in the cause of "sweet charity," and how a fellow used a car to marry off a stumbling block that was in the way between him and happiness and fortune, are all told in a breezy, conversational style. The author is a bit hazy on technicalities, for instance, making the hero of one episode say "the engine is the new kind that interlocks"—must be extremely new; we hadn't heard of it. That does not interfere with plot, however, and it is as a means of killing an idle hour that the stories will be used and not as a book of technical instruction.

No. 1, Vol. 1, of *l'Autonautique*, a French monthly devoted, as its name implies, to motor-boating or marine motoring, has appeared, published in Paris, and is edited by Maurice d'Orfeuil. The new publication is well illustrated and the typographical work throughout is of a high order. No digressions into other fields than that of motor-boating are made, the subject being adhered to from cover to cover, and thoroughly covered, so far as racing is concerned, this being the most spectacular feature of the sport and, naturally, the one that appeals most strongly to the public taste. The new paper is of liberal size, having pages nine and a half by twelve and a half inches; the first issue has thirty-two pages. It is published by H. Desforges, 39 Quai des Grands-Augustins, Paris.

C. D. Walker says he wants to run over one man before he quits with his automobile: the chief of police.—Atchison, Kans., *Globe*.

NEWARK ORPHANS' DAY.

Nearly 200 Children Enjoy Auto Ride in Club Members' Cars.

Special Correspondence.

NEWARK, June 19.—Upwards of 200 orphan children from the various institutions of this city enjoyed one of the best outings ever given them in their lives when they were the guests of the New Jersey Automobile and Motor Club last Wednesday afternoon. The club members furnished forty-five cars to convey them on a trip of twenty-five miles over Essex and Union county roads.

After the ride the children were brought to Olympic Park, where more than an hour was spent in amusement. After the children had been safely returned to their respective homes, it was found that not a single mishap of any kind occurred to mar the day's outing, which was a decided success.

J. H. Wood acted as grand marshal in the absence of Dr. James R. English, who was detained on business, but joined the run later in the day. The cars were all decorated with American flags and a large crowd watched the procession.

MOONLIGHT DRIVE ENDS FATALLY.

Special Correspondence.

BOSTON, June 17.—A fatal automobile accident, due apparently to fast driving at night, occurred in Saugus, about ten miles north of Boston early last Thursday morning. It resulted in the death of William Butler Woodbridge, vice-president of the Columbian National Life Insurance Company, and the serious injury of S. H. Wolf, of New York, an actuary connected with the same company. Arthur E. Childs, a Boston business man and the owner of the car, and W. E. Tenzler, the chauffeur, were the other members of the party, but these two were not seriously injured.

The car was a Pope-Robinson and was being driven by Mr. Childs. The party had been attending the Country Club races at Brookline in the afternoon, and as the moon was bright in the evening, decided to take a spin. They drove down the North Shore, and it is said were making fast time along the old Newburyport turnpike when the accident occurred. There was a sharp turn in the road, and Mr. Childs, being confused apparently by the shadows cast by the moon, did not see it quickly enough. When he found that he could not make the turn he put on the brakes and steered for an opening between two trees. The machine, however, struck a mound of earth and turned completely over. Mr. Woodbridge was instantly killed and Mr. Wolf was made unconscious. Childs and Tenzler secured assistance and Mr. Wolf was taken to the Lynn Hospital where it was found that he was suffering from concussion of the brain. At last reports he was improving. Beyond the smashing of the lamps and the damaging of the body, the car was not much damaged.

NASHVILLE FALLS IN LINE.

Local Club Planning Race Meet and Hill Climb for Early July.

Special Correspondence.

NASHVILLE, TENN., June 17.—The Nashville Automobile Club is planning a race meet and hill-climbing contest, to be held in this city early in July. Automobile races have been held here before, but never a hill climb, and much interest will naturally attach to the latter event. The committee in charge of arrangements is composed of John T. Landis, chairman; W. J. Cummins, Duncan R. Dorris, John W. Chester and Thomas J. Tyne.

An effort will be made to hold the hill climb on the Harding road, about nine miles west of the city, and but a short distance from historic Belle Meade farm. The hill is one mile in length, with an average grade of 14 per cent. The course is generally winding, with many sharp turns and some compound curves.

The American Automobile Association will be asked to sanction the events.

The annual automobile carnival at Long Branch, N. J., will be held August 14 to 19. As now arranged the program will consist of an automobile show at the West End, racing at Elwood Park track, and a floral parade on the last day. Entry blanks for the races and parade can be had upon application to Secretary W. J. Morgan, 116 Nassau street, New York City.

ORPHAN CHILDREN OF NEWARK, AT OLYMPIC PARK, ENJOYING OUTING IN CARS OF NEW JERSEY AUTO AND MOTOR CLUB.

CAPE MAY CLUB FORMED.

To Promote Racing on Cape May Beach. First Meeting in July.

Special Correspondence.

PHILADELPHIA, June 19.—At a meeting held in this city last Wednesday, attended by more than two score enthusiasts, initial steps were taken with a view to making the Cape May beach course an automobile racing ground, and it is predicted that it will in time rival the now famous Ormond-Daytona beach.

After a rather general discussion of the merits of the Cape May course, it was decided to form a racing organization, and within a few minutes Edwin B. Smith had been elected president of the Cape May Automobile Club, and John Hiscock elected secretary. The election of other officers was deferred to a meeting which will be held on June 21. A committee was appointed to frame by-laws, and empowered to suggest names for vice-presidents and regulations regarding membership in the new club.

It was unofficially announced that the first race meet at Cape May will be held about the middle of July.

AUTO ROAD MAXIMS.

Rules Issued by Massachusetts Club for Guidance of Members.

Special Correspondence.

BOSTON, June 17.—The following "Road Maxims for Motorists" have been issued by the runs and tours committee of the Massachusetts Automobile Club, having been copied from the maxims of the Hon. John Scott Montague, M. P., of London:

DRIVE SLOWLY through towns and villages; when approaching cross-roads, or turning corners; when passing schools, cottages and churches; on dusty or muddy roads, when passing cyclists or pedestrians; when meeting or overtaking lady cyclists; and do not steer too closely to them; when entering a main road from a side road; when you see a drunken man on the road, and when passing any live animals on the road, cows, sheep, dogs, etc.

STOP when an accident of any kind occurs, whether your fault or not. Render all the assistance in your power, and as a safeguard against future proceedings ascertain the names and addresses of a few witnesses; when you see any likelihood of a horse becoming restive. If necessary, do this even before the driver holds up a warning hand.

ALWAYS ASSUME that other road users may do the wrong thing, *i. e.*, a driver may pull the wrong rein, or a pedestrian hesitate and try several courses; that it is your business, not the other man's, to avoid danger.

The road is free for all; therefore be courteous and considerate, and always drive like a gentleman.

BUFFALO CLUB PARADE.

First Event of Season Well Attended—Enjoyable Run Follows.

Special Correspondence.

BUFFALO, June 17.—After two postponements, the Automobile Club of Buffalo today succeeded in formally opening the season with a parade and short run into the country. Scores of automobiles assembled in front of the club's rooms at Main and Goodell streets, and the parade started at 3 o'clock. The perfect weather conditions were responsible for the large number of participants.

Police Judge Thomas Murphy was the only one of the city officials invited who appeared. Two policemen mounted on motor-cycles led the parade, and set the pace. The route was from Goodell street down Main street to the Terrace, to Franklin, to Chippewa, to Delaware, to Chapin Parkway, around Delaware Park, to Humboldt, and to Humboldt Park. At this point the parade ended and the affair became a go-as-you-please run to Depew. Dinner was served at the Depew Inn.

This event was one of the most enthusiastic and successful in the history of the club.

CALIFORNIA CLUB'S TWO-DAY RUN.

Special Correspondence.

SAN FRANCISCO, June 14.—The Automobile Club of California held its second run of the season, and the most successful in its history, last Saturday and Sunday to Santa Cruz and return. More than 100 cars participated under the captancy of C. C. Moore of the Board of Governors. Most of the participants ran over the mountain road by way of Los Gatos and San Jose, and report the route by far the most enjoyable between the two cities. Fully 400 club members and their friends assembled at the Sea Beach Hotel Saturday night at the informal ball given in honor of the run. The club was entertained Sunday by runs to the Big Trees, Capitola, and near by resorts, and by concerts and fireworks in the evening.

BAY STATE ASSOCIATION OUTING.

Special Correspondence.

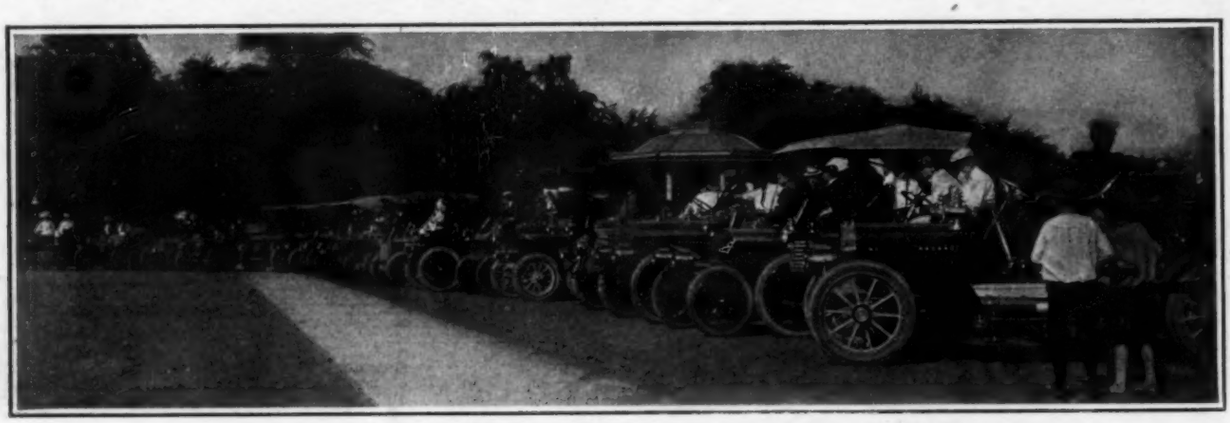
BOSTON, June 17.—More than 100 members of the Bay State Automobile Association and their friends left Boston this forenoon for a two days' club outing. There was no set time for starting, but a considerable number got away at about 9 o'clock. The destination was Rye Beach, near Portsmouth, N. H., where the cars arrived about noon. After dinner at the Farragut House, which is headquarters, a ball game was arranged between two teams, one captained by William Gray, of Gray & Davis, of Amesbury, and composed of the light-weights of the association, and the other, led by W. H. Durphy, the manager of the local branch of the Decauville company, which included some of the clubmen who tip the scales at near two hundred pounds. In the evening there was an entertainment by a company of forty-eight from Amesbury, and afterwards there was a dance. To-morrow the tourists will spend the day about the beach, and will make the run back here in the afternoon or evening. Some are planning to stop on the way for supper as Newburyport and to make the trip from there by moonlight.

NEWS NOTES OF THE CLUBS.

MINNEAPOLIS, MINN.—A hill climbing contest will be held on Saturday, June 24, under the auspices of the Minneapolis Automobile Club. The contest will take place on Kenwood Hill, the longest and steepest grade within the city limits, and events will be provided for professionals and amateurs.

DENVER, COLO.—The Denver A. C. will give the orphans of the city an outing on June 24. All automobile owners in the city have been requested to allow the use of their cars for the purpose, and it is expected that about 500 of the little ones will be given an opportunity to enjoy their first automobile ride. The officers of the club are particularly active in their efforts to make Denver's first Orphans' Day a huge success.

ELMIRA, N. Y.—On last Friday evening the first automobile parade ever witnessed in this city was held under the auspices of the Elmira A. C. More than fifty cars were in line, and most of them were beau-



LINE-UP OF BUFFALO CLUB MEMBERS IN HUMBOLDT PARK AFTER PARADE LAST SATURDAY.

tifully decorated. The streets along the route of the parade were thronged with spectators who cheered heartily as the procession passed. The officers of the club are highly elated at the success of their first venture in this direction, and promise another such event in the early fall.

PHILADELPHIA.—The second moonlight run of the Automobile Club of Philadelphia brought together an even score of machines. It was a most enjoyable affair, supper being served in the café of the Merion Cricket Club at Ardmore at 7 o'clock, and the city was reached on the return trip at about 10 o'clock. Fifty-six persons, many of whom were women, participated in the run, which will be repeated at an early date.

LOUISVILLE, KY.—The third annual parade of the Louisville Automobile Club was held on June 10, and was by far the most interesting event ever attempted by the club. More than 250 cars took part, many of which were decorated. The parade traversed the principal streets of the city, and ended with a run to Fontaine Ferry, where dinner was served.

LOS ANGELES, CAL.—The recent meeting of the Automobile Club of Southern California resulted in the election of the following officers: Dr. Milbank Johnson, president; Hancock Banning, first vice-president; Charles Wellborn, second vice-president; A. P. Fleming, secretary; Harry Callender, treasurer; B. H. Cass, W. H. Thayer, W. M. Garland and C. Allen Hancock, governors.

ORTWELL, VT.—The Vermont Automobile Club held an informal meeting at Montpelier on Tuesday afternoon, June 13, when it was decided to hold a club run to the White Mountains early in July, the date to be announced later. Machine owners from the southern part of the State will rendezvous at White River Junction, and those from the northern section will assemble at Montpelier, all meeting the following day at Wells River, or Littleton, and going into the mountains together. The club now has a membership of one hundred.

WAUKEGAN, ILL.—The Waukegan Automobile Club has recently been formed, having for its principal object the protection of its members. Organized efforts will be made to prevent the enactment of any unjust laws or regulations. The following officers were elected: Richard S. Morrow, president; Dr. A. E. Brown, vice-president; Will J. Smith, secretary; Tom Grady, treasurer, and William F. Weiss, business manager and counsel. William S. Bullock and Messrs. Fowler, Yeoman, Schwartz and Morrow constitute the board of governors.

MILWAUKEE.—A project to extend the club to state-wide membership was indorsed by the Milwaukee Automobile Club at a regular monthly meeting at the Hotel Pfister last Thursday night. This step is the result of the action of the legislature in passing an automobile bill which is state-wide in its operation. It is believed that if the automobilists of Wisconsin present a solid front, the work for good roads, guide posts, and similar benefits would be greatly facilitated. James T. Drought, Christian Scholtke, and J. W. Brown were appointed a committee on the extension. Mayor Rose was present at the meeting and urged the members to participate in the automobile floral parade that will be held this week during the convention of the Modern Woodmen. Sherburn Becker has received acceptances from fifty automobilists, and the club decided to be represented in a body, decorating their machines with the Woodmen carnival colors, red, white and green.

TRADE IN THE SOUTH.

Good Roads a More Important Factor Than General Enterprise.

Special Correspondence.

MEMPHIS, June 17.—To the manufacturer of automobiles who is trying to introduce his cars into new territory, and establish himself in a section of the country that is just taking its first steps in automobilism, the Middle South—particularly the states of Georgia, Alabama, Tennessee, Mississippi, Louisiana and Arkansas—furnishes a peculiar anomaly. Apparently the most prosperous and rapidly growing cities are the ones that are making the least demand for automobiles.

Strange as it may seem, Savannah is the best automobile town in the states named, while Nashville ranks second, and both are generally regarded as "slow towns." Memphis and Birmingham, two of the most prosperous and ordinarily wide-awake towns, are apparently satisfied with street cars and horse-drawn vehicles as modes of locomotion. This condition is perhaps largely due to the wagon roads in the respective sections. While Nashville and Savannah are rather quiet towns from a business point of view, both are surrounded by a network of good roads. This cannot be said of the other larger towns of the states named.

Another good automobile town, however, is New Orleans. A big city with a large semi-leisure class, it has taken to automobiles fairly well, and there are about 150 cars in use there. Savannah has about 200, and Nashville is well over the century mark.

As a state, Georgia leads. With well established automobile colonies at Savannah, Atlanta, Macon, Augusta and Columbus, there is a fair number of machines in use, Atlanta alone having more than 100 cars.

Tennessee ranks second among the southern states, and has some notably good roads. Nashville is the most important center, Memphis second, Chattanooga, with its fifty machines, third, and Knoxville fourth.

Alabama has but little to boast of in the automobile line, Birmingham, Montgomery and Mobile alone being worthy of note, and but comparatively few cars are used in those places. Arkansas has a few machines at Little Rock, and fewer at Hot Springs, but the Darkest Africa of southern automobiledom is Mississippi, which has not a single large town, and but little to mention in the way of good roads. The automobile is seldom seen in that section. Historic old Vicksburg has half a dozen cars, and so has hustling Jackson, the capital, but the dealers in Mississippi have little to keep them busy, and scant attention is paid to the state by manufacturers.

The outlook for the automobile in the South, however, is steadily growing brighter, roads and times are improving, and the day is not far distant when manufacturers of cars will turn their attention to this section of the country.

BOSTON DEALERS' MEETING.

Principal Officers Re-Elected and Local Show Situation Discussed.

Special Correspondence.

BOSTON, June 17.—Local automobile dealers were out in force at the annual meeting of the Boston Automobile Dealers' Association last Tuesday, so many of them attending that Secretary Campbell's office was hardly large enough to accommodate them. Nothing was said about the local show situation until all the other business was transacted, when a member of the executive committee asked Secretary Campbell what he had heard. Mr. Campbell reported that he had received no formal communication, but that he understood, unofficially, that the National Association of Automobile Manufacturers proposed to withold a sanction unless an arrangement was made whereby all exhibitors would share in the profits according to the amount of space taken, and that branch managers must give up their share of the profits of the last March show to their home companies.

Several members of the dealers' association spoke on the matter, and it was evident that while the local agents are willing to make any concessions that are necessary in order that the branch managers may not suffer, they will not give up their right to manage their show as they see fit, and they will not brook any interference from outside.

President Skinner presided at the meeting and the following board of directors was elected: K. A. Skinner, J. H. MacAlman, George H. Lowe, A. E. Morrison, W. J. Foss, W. W. Burke, C. I. Campbell, and A. P. Underhill. J. H. MacAlman was re-elected treasurer, and Chester I. Campbell, secretary. The directors later re-elected Mr. Skinner president and Mr. Morrison vice-president. The show committee was not appointed at this meeting, but will be named later. The association voted to provide automobiles to take thirty blind boys from the Perkins Institution for the Blind on a trip to Sharon and return next Tuesday.

ADOPT UNIFORM CHARGES.

Action of San Francisco Dealers Displeases Patrons, Who Threaten Retaliation.

Special Correspondence.

SAN FRANCISCO, June 11.—The Automobile Dealers' Association of Southern California, which has headquarters in Los Angeles, has raised a howl by the adoption of a new schedule of garage charges. A circular letter has been sent to patrons calling attention to the great lack of uniformity in garage charges, and stating that after careful consideration of the cost of rendering good services, the Association has adopted the schedule of minimum charges for garage service and repair work, which was inclosed with the letter.

Following is the schedule, which is signed by the White Garage, E. J. Bennett, L. H. Johnson, R. C. Hamlin, L. A. Automobile Co., W. K. Cowan, A. P. Worthington, Auto Vehicle Co., Lee Automobile, Pioneer Motor Co., Peerless Motor Car Agency, Western Motor Car Co., Middleton Motor Car Co., J. A. Rosesteel, Gilbert Woodill Auto Co., Angelus Garage Co.

Minimum rates for garage service per month:

Touring cars, 24 horsepower and over, and all foreign cars, $30.

Touring cars under 24 horsepower, as follows: White, Stevens-Duryea 4-cylinder, Autocar 4-cylinder, Haynes-Apperson, Rambler side entrance, Tourist 4-cylinder, Winton "C," Wayne 4-cylinder, Ford 4-cylinder, Cleveland 4-cylinder, Franklin 20 horsepower, $25.

Light tonneau cars as follows: Ford, Cadillac, Autocar, Buick, Olds, Pathfinder, Tourist, Stevens-Duryea, Haynes-Apperson, and Pierce Stanhopes, $20.

Single seated runabouts as follows: Olds, Autocar, Franklin, Cadillac, Ford, White, Stanhope, etc., $16.

Delivery wagons: Heavy, $25; light, $20;

electric runabouts, $20; two-seaters, $25. Above services include washing, polishing, and filling. Oil, gasoline, and carbide extra.

Miscellaneous garage work, minimum charge per hour, including tire work, washing, brass polishing, 60 cents.

Towing in cars, minimum per hour, $3, no charge less than $1. Gasoline per gallon, 25 cents.

Repair shop charge—All work in machine shop, minimum per hour, 75 cents.

As a result of this circular the automobile owners are talking of organizing a new garage company, to construct a suitable building and maintain it in the interest of the owners. J. Harvey McCarthy offers to start the subscription list for stock with a contribution of $1,000. McCarthy's rates under the new scale are raised from $15 a month to $25, and it is claimed that the raise is generally from 20 to 40 per cent.

GARAGE KEEPERS RAISE CHARGES.

Special Correspondence.

LOS ANGELES, June 9.—The owners of the eight or ten garages in this city surprised the owners of automobiles this week by raising the garage charges from 20 to 40 per cent., and as a combine has been formed, the owners will doubtless have to make the best of it. The garages declare they have been losing money for months and do not propose to drop any more. The price of gasoline has also been raised, and some of the owners think they are up against a trust so hard that they propose to either build their own garages in their back yards or organize a joint stock company to construct a big garage for members only.

TRUCK COMPANY IN NEW FACTORY.

Special Correspondence.

SPRINGFIELD, Mass., June 13.—Pending the outcome of court proceedings which will determine whether he may make use of the word "Knox" in business, Harry A. Knox has begun the manufacture of motor trucks in his new factory in Brightwood, this city. The factory is a substantial two-story brick structure, giving ample facilities for a large business. While this was being built two or three cars were gotten out in the factory of the Baush Machine Tool Co. With the completed factory in operation, work will begin in earnest and the working force will be added to from time to time until the full capacity of the plant is developed.

An interesting and hard-fought legal battle is in progress between the Knox Automobile Co., of this city, and Mr. Knox in which the company is seeking to permanently restrain the latter from making use of the word "Knox" in advertising his products or as any component part of the firm name. It is the contention of the plaintiff that it has become so widely known by this word that its use by another would work irreparable injury. The fight now on in Superior Court is for the final settlement of the matter.

RECENT INCORPORATIONS.

Beacon Automobile Co., Newark, N. J.; capital, $10,000. Incorporators, Charles E. Weed, B. Devereaux Barker, Clarence N. Gray, Karl Singer and Harry H. Picking.

Central Automobile Co., Pittsfield, Mass.; capital, $15,000; to manufacture automobiles. President, Frank Weston; Treasurer, L. A. Merchant.

Century Auto-Power Co., East Orange, N. J.; capital, $125,000; to manufacture automobiles, auto-boats, launches, etc. Incorporators, Henry R. Waite, C. A. Waite and H. L. Cadmus, all of East Orange.

News and Trade Miscellany.

John P. Schneider has been appointed agent for Buick cars in Detroit, Mich.

Duncan R. Dorris has opened a large garage at Church and Ninth streets, Nashville, Tenn.

The Automobile Exchange of Detroit has taken the agency for the Welch and Reliance cars.

The Dingfelder Garage of Detroit, Mich., now has the agency for the Reo car made by the Reo Motor Car Co., of Lansing.

The Brazier Automobile Co. will open a West Philadelphia branch garage at No. 4 South Thirty-eighth street, on June 24.

A number of contests will be decided on July 4 at Port Huron, Mich. These races will be part of the celebrations of the day.

Young & Miller, agents for the Elmore and Yale cars, have moved into new quarters at 254 Jefferson avenue, Detroit, Mich.

The Parsons Auto Transit Co., of Parsons, Kan., has received an order to build three 16-passenger automobiles to be used in Parsons on a regular 'bus route.

It is expected that three power boat races will be held this season under the auspices of the Detroit Yacht Club, the American Power Boat Association rules to govern.

The Excelsior Supply Co., of Chicago., has acquired the entire bicycle and automobile sundry stock of the western branch of the Pope Manufacturing Co.

Oscar Arnold has secured the exclusive agency for Columbia cars in Havana and the Island of Cuba. The agency will be located at Mercardares No. 31, Havana, Cuba.

S. D. Waldon, sales manager of the Packard Motor Car Co. of Detroit, Mich., is spending a vacation in northern Ontario, and will employ his leisure moments with the rod and fly.

Ex-Governor Henry T. Gage, of Los Angeles, wanting to test the new numbering law in California, drives a Thomas Flyer about the city without a state number attached to the car.

Northwestern Ohio will hold its first automobile field day of the season on July 8, in Toledo, on either the Tri-State Fair Grounds or the Ottawa Park Boulevard. The prizes will be announced later.

It is expected that the auto-boat enthusiasts of Detroit will shortly see a race between Fred L. Smith's Olds 6-cylinder boat and the new Winton 12-cylinder racing boat that is to be launched June 28.

A verdict has been rendered in favor of Fred Wilner of Kansas City, Kan., against E. L. Thompson, who sued for damages on the ground that Wilner's machine caused a runaway in which Thompson was injured.

Caps Brothers, of Kansas City, Mo., will shortly undertake the construction of commercial cars, it is announced. They are now building a tonneau car of the double opposed cylinder type to seat four persons.

The Auto Express Co. of Detroit, which was organized last January to handle the deliveries of retail stores, has moved into new quarters at 42 to 46 Randolph street, where it has more than 10,000 feet floor area.

Eight automobilists were recently fined $16.50 each for breaking the speed law in the Borough of Jenkintown, Pa. Charles Swartz, a councilman, who assisted in drawing up the ordinance, was one of the violators.

George H. Hood, of Boston, is a recent purchaser of a 50-horsepower Thomas car of special design. It is fitted with a removable limousine body, and is equipped with electric lights, speaking tubes, toilet cases, and comfortably seats five persons in the rear seats.

The old factory building on Callowhill street, Philadelphia, which was recently abandoned by the Fairmont Engineering Works for larger quarters, has been leased for storehouse purposes by the Philadelphia branch of Thomas B. Jeffery & Co., makers of Rambler cars.

The Pope Manufacturing Co. will shortly remove its bicycle plant from Hartford to Westfield, Mass., and utilize the space thus obtained for building the new Pope automobile truck. The Western Department, now located in Chicago, will also be removed to Hartford, Conn.

There will be no change in the conduct of the business of the Never-Miss Spark Plug Co., of Lansing, Mich., because of the recent death of J. L. Ash, the senior member of the company. W. L. Ash, the junior partner, will continue the business under the same name as heretofore.

The Burlington Basket Company, which manufactures the "Hawkeye" refrigerator basket, illustrated and described in THE AUTOMOBILE, June 8, in the "Information for Buyers" page, is located at 33 Main street, Burlington, Iowa. The address was erroneously given as Burlington, Vermont. The basket has a metal lining and a compartment at one end for ice. As the two Burlingtons are a long distance apart the error was an unfortunate one.

Owing to the steadily increasing demands of their business, Locke & Co., the well known automobile body builders of 218-220 West Eighty-fourth street, New York City, have had to enlarge their quarters, and have contracted for a two-story addition to their building, 50 by 100 feet. Work on this addition will begin at once.

The Wayne Automobile Co. announces the establishment of the following agencies for the sale of its cars: Gordon & Co., 95 High Holborn, London, E. C.; H. W. Clark, Omaha, Neb.; Gudger & Ewing, and James Phelan, Stockton, Kan.; F. Herbst, Wilmington, N. C., and H. S. Townsley, 523 Homewood avenue, Pittsburg, Pa.

New legislation has caused the Ontario government to have a new automobile number designed. The new marker or plate will be in black rubber with figures five inches long in white vulcanized on. Automobilists are given until July 15 to secure these, at a cost of $1.50 each. The license fee also is likely to be increased from $2 to $4.

Among those who sailed for Europe on the steamship *Majestic* last Wednesday were A. E. Schaaef, manager of the Pope Motor Car Co.; Carl Fisher, Orlando Weber and Harry Turner, agents for the Pope cars at Indianapolis, Chicago and St. Louis, respectively, who have gone abroad to witness the forthcoming Gordon Bennett Cup Race.

The American Manufacturers' Co. of Washington, D. C., is trying to find a location for its plant in Nashville, Tenn. It will manufacture autos and parts used in the construction of runabouts and touring cars, and will be capitalized at $1,000,000. Should the company find a location, its factories in Washington, D. C., and Alexandria, Va., will be merged into one at Nashville. Frank L. Carter is secretary, treasurer and general manager.